

In This Issue—*The House That Service Built*

# MOTOR AGE

Vol. XLVI  
Number 10

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CHICAGO, SEPTEMBER 4, 1924

Thirty-five Cents a Copy  
Three Dollars a Year

**D**ISTRIBUTORS selling volume lines, in congratulating us on The Great Jordan Line Eight, tell us they are glad to see someone with nerve enough to build a better car instead of a cheaper one.

*Edward S. Jordan*

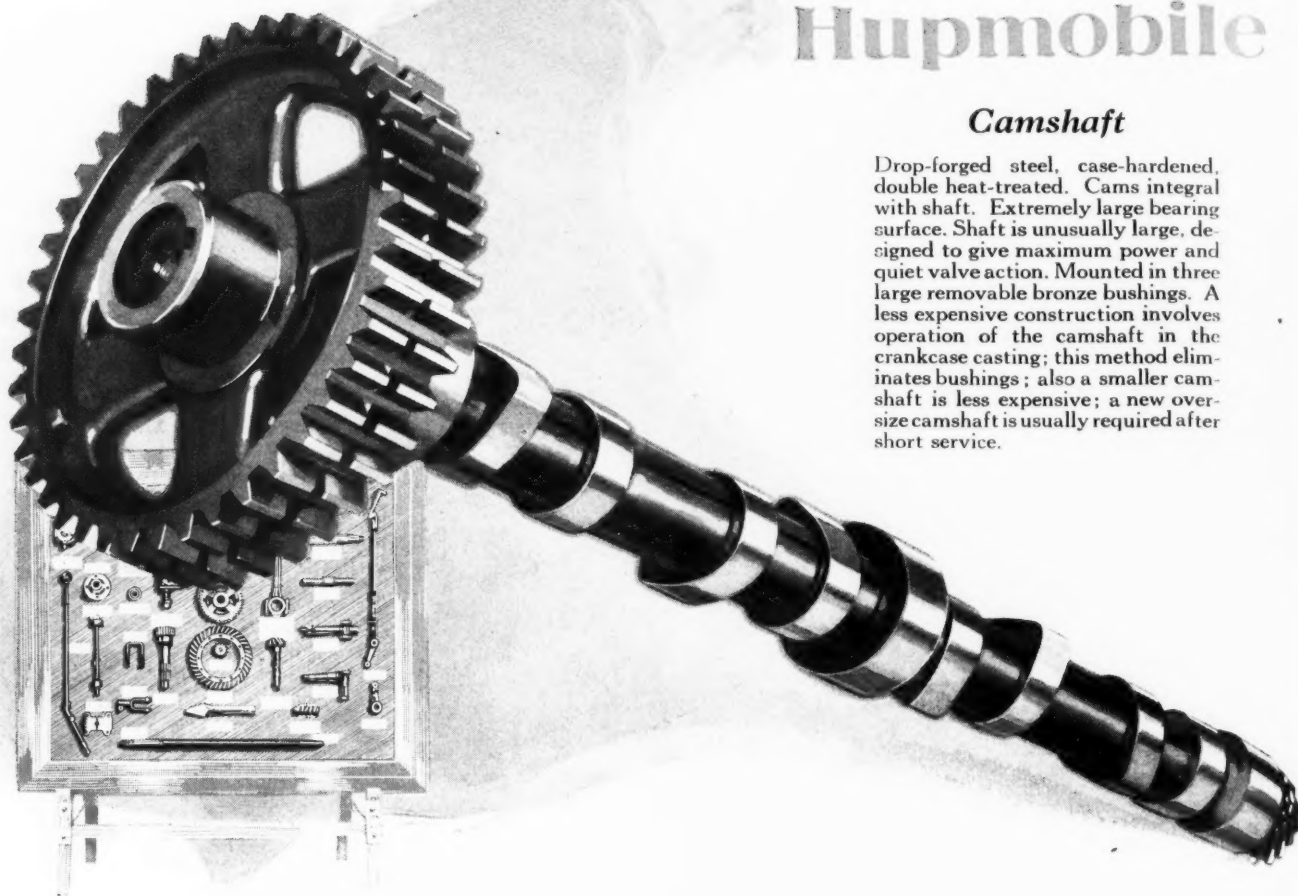
President  
Jordan Motor Car Company  
Cleveland, Ohio



# Hupmobile

## Camshaft

Drop-forged steel, case-hardened, double heat-treated. Cams integral with shaft. Extremely large bearing surface. Shaft is unusually large, designed to give maximum power and quiet valve action. Mounted in three large removable bronze bushings. A less expensive construction involves operation of the camshaft in the crankcase casting; this method eliminates bushings; also a smaller camshaft is less expensive; a new over-size camshaft is usually required after short service.



## Proving to Prospects That They Can't Get a Better Car Than Hupmobile

Hupmobile has introduced a new and better element into automobile selling. A sales policy that is as sound and practical as the car itself.

Hupmobile takes all the mystery out of automobile specifications and makes them a very real selling help.

### *The Prospect Convinces Himself*

The dealer asks his prospects to check the parts in Hupmobile construction against any car, of any make, at any price.

To check the parts for quality of mate-

rials, and for fineness of processing and fabrication.

The prospect can thus prove to himself conclusively that there is no better made car than Hupmobile.

The Hupmobile dealer has an easier task—for his prospect has every opportunity of convincing himself.

He readily sees that it gives him comfort, luxury, riding and driving ease, an extraordinary verve and pick-up, endurance almost beyond comparison; thousands and thousands of miles of low cost use.

And there is a rock bottom basis for all that.

For we say to you, as one member of the motor car fraternity to another, that no car at or near its price can surpass Hupmobile in quality of materials and fineness of manufacturing. Check the parts and prove it for yourself.

### *A Strong Alliance For Any Dealer*

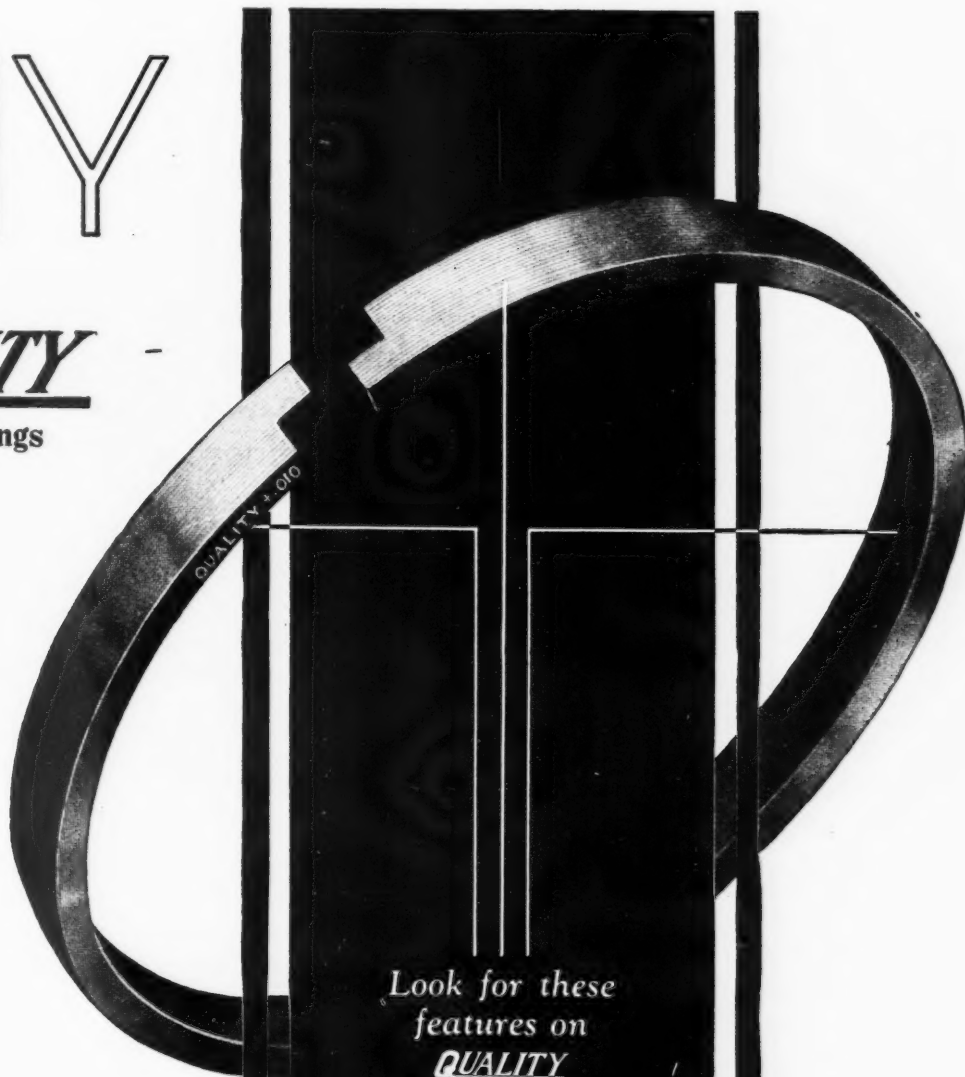
Why not form an alliance with a car and a company that enjoy an unexcelled reputation for being particularly good for the dealer from the viewpoint of profit.

**Hupp Motor Car Corporation**  
Detroit, Michigan



# WHY

## **QUALITY** Piston Rings



Because they are made in the largest and most efficiently equipped piston ring plant in the world, by an organization whose high standards of accuracy and quality have always been faithfully maintained.

Because they represent the results of manufacturing skill, knowledge and economy acquired through the production of over 127,000,000 **QUALITY** Piston Rings, made to the rigid specifications of many of the world's foremost automotive engineers.

Because they have back of them an unsurpassed record for accuracy, long life and unfailing dependability.

*The Piston*  
**RING COMPANY**  
*Muskegon, Michigan*

Look for these  
features on  
**QUALITY**  
Piston Rings

The word "Quality" is stamped upon each ring with all oversizes plainly marked.

The turned surface makes quick seating certain.

The skin of the casting left on the inside of the ring assures long life and lasting resiliency.





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*Order through Your Nearest Jobber or Write to Us*



*We also supply 8-leaf and 10-leaf front and 9-leaf and 11-leaf rear springs for Fords —also a complete line of Ford spring accessories, such as extra-long clips, clip plates etc.*

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# MOTOR AGE

Reg. U. S. Pat. Office

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 W. L. CARVER, Field Editor  
 PAUL L. DUMAS  
 C. G. SINSABAUGH, News Editor  
 D. M. McDONALD, Detroit News Rep.

SAM SHELTON, Editor  
 DONALD BLANCHARD, Field Editor  
 A. H. PACKER  
 TOM WILDER  
 WARREN BAKER, Ass't. News Editor  
 CLARENCE PHILLIPS, Chicago News Rep.

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C. A. MUSSELMAN  
 President and General Manager  
 A. B. SWETLAND, Vice-Pres. and Manager W. I. RALPH, Vice-President  
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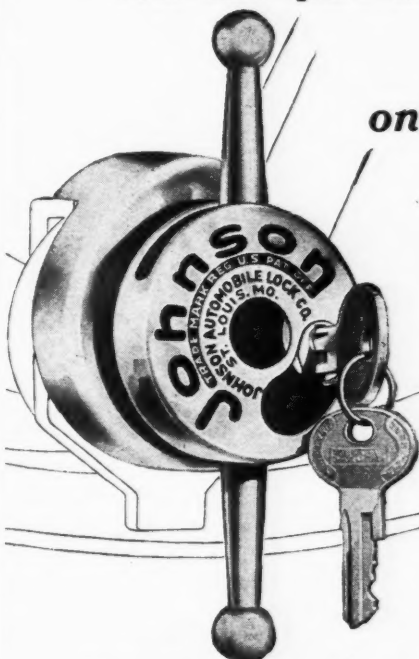
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 Entered as Second Class Matter Sept. 19, 1899, at the Post Office  
 at Chicago, Ill., under Act of March 6, 1879.

## Here's the NEW NUTLOK

Prevents the theft of spare  
 tires and spare disc wheels



only

**\$5.00**

—and it's a  
**Johnson**

Built like a  
 bank vault

### Sell Real Theft Protection for Spare Tires and Spare Disc Wheels

Sell the new Johnson "Nutlok"! It safeguards spare tires that are held to the tire carrier by bolt and nut. Screws onto the bolt. Locks onto it in place of the nut, and is the only tire lock that *eliminates the use of a wrench to remove the tire!*

The locking mechanism is enclosed in an impregnable special steel body — attractively nickel-plated — Bar-arm Type. A turn of the key locks a steel stud into one of two recesses in the interior of a steel lug. Holds solidly. Withstands hardest blows. Unlocks only with the owner's own key. Prevents the theft of spare tires or spare disc wheels on 36 makes of cars.

It's selling fast! A real money-maker! Automobile dealers everywhere are selling it. Order now. Write us direct. Dept. A.

**Johnson Automobile Lock Co.**

4121 Forest Park Boulevard

St. Louis, Mo.

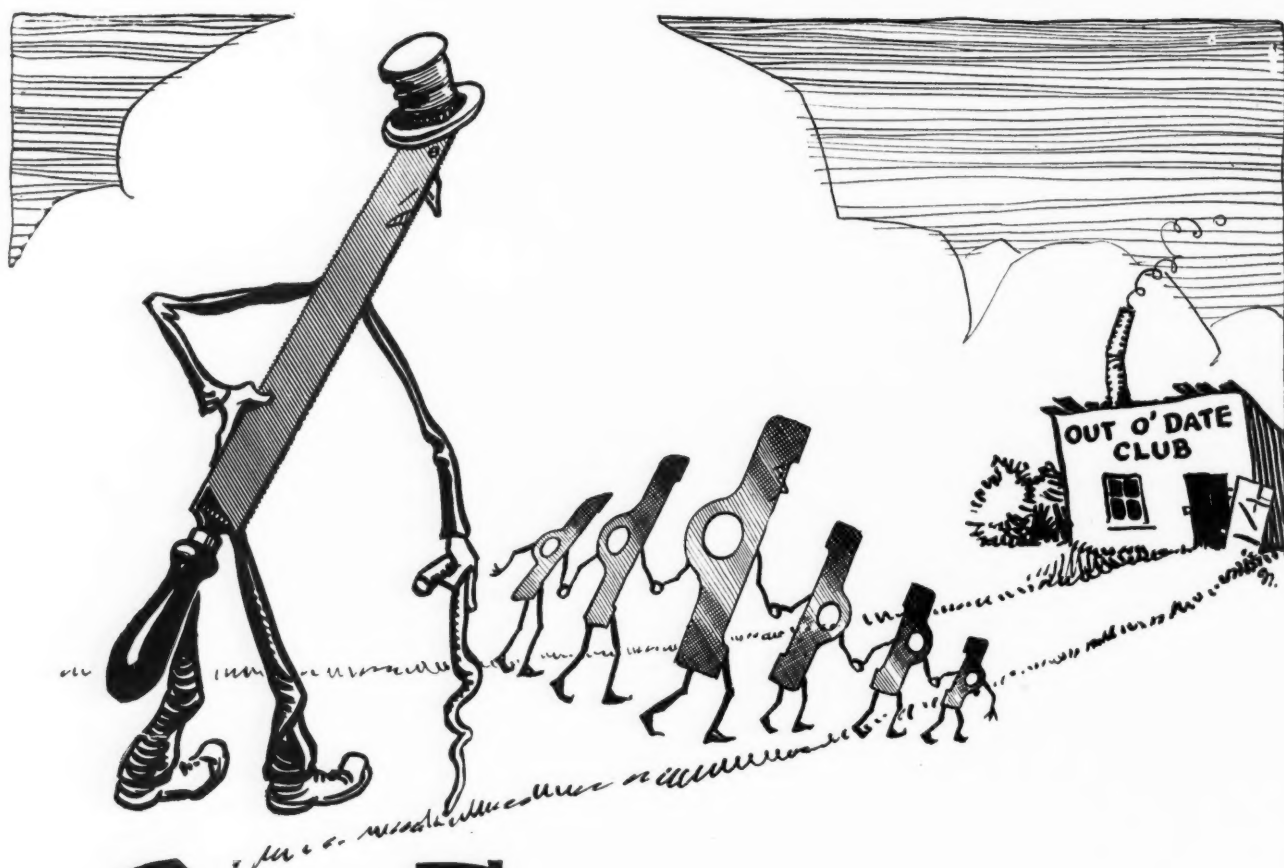
Makers of the famous  
 Johnson Transmission Lock  
 and the

Johnson Armored Cable Spare Tire Lock

# Johnson

SPARE TIRE LOCK





# Gone Forever~

*All the little Loose-leaves and old Mr. File*

**T**HEY'RE gone. The troublesome loose-leaf family and rough Mr. File. No one wants to fuss with a bunch o' loose leaves — when it's so easy to **PEEL LAMINUM.**

Busy repairmen never waste time filing a solid metal. They **PEEL** off the layers of **LAMINUM.** Everyone **PEELS** shims, saving 1 to 4 hours on each adjustment job. A shim for every make of car. All jobbers sell **LAMINATED Shims.**

*Address "Sales Department"*

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# LAMINUM



# September 14th is the day of the big Studebaker announcement!

See this page next  
week or any news-  
paper of Sunday,  
September 14th

THE STUDEBAKER CORPORATION OF AMERICA

SOUTH BEND, INDIANA

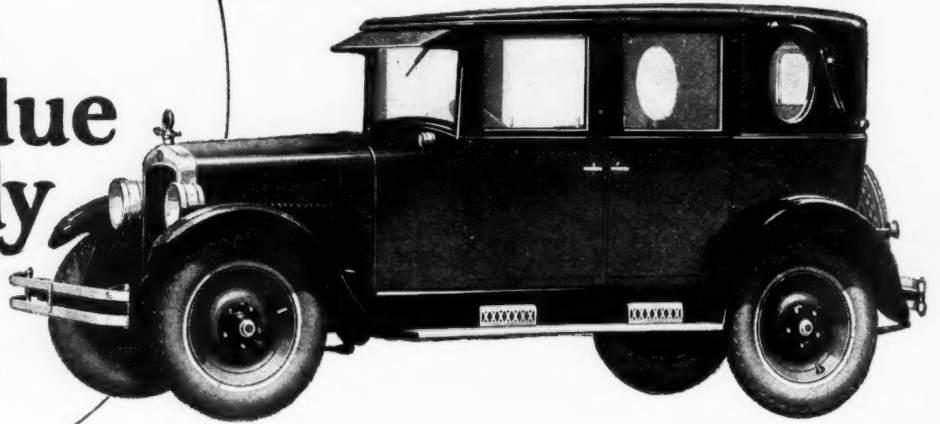
T H I S   I S   A   S T U D E B A K E R   Y E A R





# A Brand New Member of a True Blue Family

*The Oakland  
Landau Sedan*



The new Oakland Six Landau Sedan will bring the checkbooks and fountain pens out into the open.

For the Landau Sedan is first of all a True Blue Oakland, a new member of the group that is standing all previous Oakland selling records on end and putting dealer profits over the top.

Here is distinction on four wheels. There isn't anything in Oakland's price group that even approaches its smartness and completeness of equipment—and not a handful among the higher priced cars!

These are enthusiastic words, but here are the uncommon features of this uncommon car:

*A Year in  
Advance  
of its Field*

Advanced design L-head 6-cylinder engine  
Four-wheel brakes  
Duco body finish in Buckingham gray with carmine striping, black upper structure  
Balloon tires and disc wheels  
Snubbers on front springs  
New Fisher one-piece ventilating windshield  
Automatic windshield wiper  
Permanent visor

Gasoline gauge on instrument board  
Transmission lock  
Nickel doubled-bar bumpers front — nickel fender guards rear  
Nickel drum-type lamps  
Nickel radiator, moto-meter with nickel wing cap  
Aluminum running-board apron shields  
Upholstery in plush mohair

Walnut mouldings  
Walnut Steering Wheel  
Rear-view mirror  
Driving controls on steering wheel  
Indirectly lighted unit instrument panel  
Invisible door checks  
Floor-type heater  
And every other worthwhile feature found on fine cars.

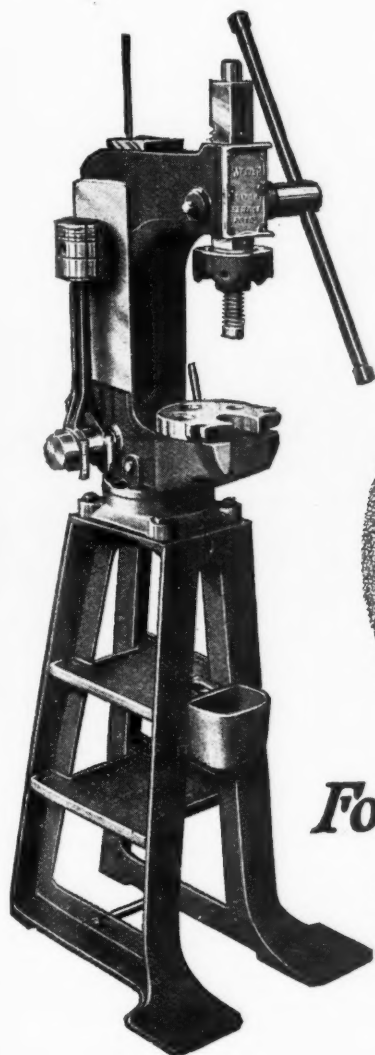
Get *your* autograph on an Oakland contract—soon!

OAKLAND MOTOR CAR COMPANY, PONTIAC, MICHIGAN





# Every repair shop needs a **WEAVER** Motor Service Press



*For fitting connecting  
rod assemblies*



(Left) Twists and bends in the connecting rod can easily be detected by using the Test Block, as shown, and the rod removed to bed of press for straightening.

*For riveting brake bands*

(Right) With this Attachment you can press out old rivets, punch new holes in brake lining for various size rivets and head and countersink both tubular and solid rivets--and do a better job in a fraction of the time usually required.



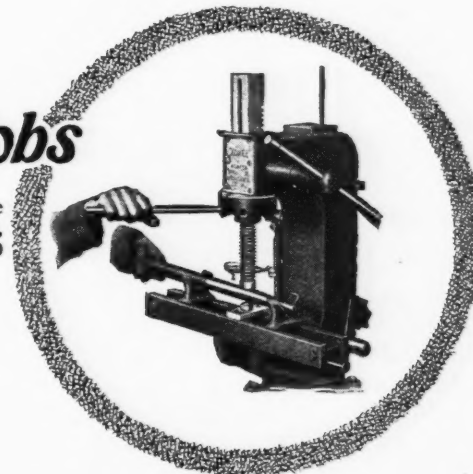
*For straightening shafts  
and other light work*



(Left) Crank shafts and other pieces requiring light pressure can readily be straightened on the Straightening Fixture, using the speedy rack and pinion leverage. Note dial gauge can be mounted in convenient position for testing shaft and the adjustable thumb screw can be set to prevent overspringing shaft.

*For heavier  
pressure jobs*

(Right) For work requiring heavier pressure the bar supplied with Press is inserted in wheel, as shown. In this way, pressure up to 10,000 lbs. can be developed on screw.



THE Weaver Motor Service Press brings within reach of every shop the services of a number of essential tools needed for every day work at a fraction of their cost if purchased separately.

It offers in one compact unit a speedy rack and pinion press, a five ton screw press, a piston aligning jig, a brake reliner and straightening fixture, as shown in the accompanying illustrations.

If you are interested in turning out better work at a lower cost, ask your jobber for complete information.



*The best equipped shop gets the business*

**Weaver Manufacturing Co.**  
Springfield, Illinois, U. S. A.  
Weaver Canadian Co. Ltd., Chatham, Ont.



# Your Choice of 4 WEED BUMPERS FOR ANY LIGHT CAR

*Same Fittings*

*for All 4 Bars*

## Weed Safety Light Car Bumper

List Price:	Complete
Black	Nickel
\$12.50	\$13.50

## Weed Sentry Bumper Model D

List Price:	Complete
Black	Nickel
\$16.50	\$17.00

## Weed Twinbar Bumper

List Price:	Complete
Black	Nickel
\$11.00	\$12.00

## Weed Security Bumper

List Price:	Complete
Nickel	
\$12.50	

*They Fit Right*

*They Hold Tight*

There are all kinds of people with all kinds of tastes—but the trick is to satisfy them all and lose no sales. Notice that the designs of the four WEED Light Car Bumpers satisfy all popular demands and have many refinements that are lacking in ordinary light car bumpers.

Now every light car dealer, no matter what car he handles can offer his customers a choice of the four beautiful WEED Bumpers, with a wide range of prices. The size of his stock and amount invested is kept down because all four bars take the same fittings. The bars are interchangeable front and rear.

Write for illustrated folder

**AMERICAN CHAIN COMPANY, INCORPORATED**  
BRIDGEPORT, CONNECTICUT

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District Sales Offices: Boston Chicago New York Philadelphia Pittsburgh San Francisco

WORLD'S LARGEST MANUFACTURERS OF WELDED AND WELDLESS CHAINS FOR ALL PURPOSES





# MOTOR AGE

## What the Automobile Tourist Buys—and Where He Buys It

*Some Golden Opportunities Neglected by Dealers Who Should Be Prepared to Meet the Needs of the Thousands of Motor Travelers*

By SAM SHELTON

WHEREVER a good road is there goes the automobile tourist. And sometimes the tourist goes where the road is not so good, but ought to be good and will be some day if State and Federal construction plans are carried out.

As he travels, the motor tourist buys the necessities of the trip. These may be shelter, food, fuel, oil, tires, equipment or repairs. In the aggregate he spends a lot of money. If he camps he buys his shelter equipment before he starts, but still he has to buy all the other items as he goes. He spends his money with the dealers who are prepared to serve him, and the supplying of his needs has developed into a tremendous business.

This is a business that the automotive merchant naturally shares. It is largely the business of the transportation store. Food, of course, may be obtained from the customary sources and the supplying of shelter for those who do not camp is the business of the inn keepers. But all the rest of this great volume of business belongs to the transportation store—the dealer who sells automobiles or automobile supplies.

### *It Pays to Advertise*

What does the automobile tourist buy—and where? How does he find out where to buy when traveling in a strange country? The towns and the cross roads are well supplied with filling stations for gasoline and oil and usually it is not far between garages where repairs and supplies are available. But many of these shops are operated on the theory that everybody in town and in the country around knows who they are, what they represent and what they have to sell. That may be true for the immediate locality, but for the stranger who goes by, often at 30 miles an hour, the secret remains undisclosed.

It is never a safe assumption, however, for the merchant to conclude that all his prospective customers even in his own locality knows who he is, where he is and what he has to sell. He probably will never know how much money he

loses through the fact that those who need his merchandise or services are not made to think of him at the proper time. Whatever means the progressive merchant takes to make his business known to the tourist will prove equally valuable in drawing trade from his own community.

What are the possibilities of catering to the needs of the automobile tourist? Let us follow a course of some 1600 miles through the heart of our country and draw what lessons we may for the benefit of automotive merchants from the buying adventures of a motorist.

From Chicago to St. Louis is some 300 miles over paved roads with many sizeable towns and some good cities touching the highway. And the travel is heavy with cars from all states, but with Chicago and St. Louis vehicles predominating.

### *Gas Dispensers Progressive*

There are some wonderful filling stations along this road. It is apparent that the dispensers of gasoline and oil have been more progressive than have the car dealers and garage proprietors in locating their establishments conveniently to the travel and in calling attention to the service and merchandise they are prepared to provide.

And yet—

No where between Chicago and St. Louis is it possible to buy a certain specialized and highly advertised fuel ingredient which is available at hundreds of places in Chicago and St. Louis. Inquiry at the filling stations handling the brand of gasoline with which this fuel modifier is supposed to be sold brings little information. They have heard of it but it just hasn't been put in. They don't know when it will be. They have had other inquiries for it and the tone of their answers sometimes indicates just a slight irritation.

If there is any good in the use of this ingredient in gasoline, the greatest good comes on the long stretches of country road where the miles seem to slip slowly by and anything is welcomed that aids the efficient operation of a



hard worked engine. And when one gets beyond St. Louis into the hills of the Ozarks, where good roads are being built at a marvelous rate but are not yet general, there is again the lack of this fuel until the little city of Springfield is reached, some 250 miles over some hard climbs and slow pulls. Here it is possible to get all one wants of this specialized fuel and the engine is itself again.

This is cited as an instance of common defect in merchandising. The retailer doesn't have what the tourists has a right to believe he ought to have. But the faulty merchandising goes further. In too many cases the names of the fuel and oils sold are not prominently enough displayed. The tourist may be looking for a particular brand of gasoline but often he can't tell what is sold at a station until he is almost past it and then he just drives on and looks for another.

#### *Sign Boards an Effective Medium*

The progressive gasoline filling station ought to be able to greatly increase its business by judicious use of sign boards. Most state highway systems forbid sign boards, except the official markers, on the right of way, but these may be erected on private property adjoining the road. Large and unsightly sign boards are not to be desired even there, but in many cases the use of neat signs to give trade information to tourists would be a real service. Many modern filling stations now provide rest rooms equipped with toilets for the convenience of motor travelers. Very often parties touring watch for these stations to stop for fuel and oil. Unless there is something to tell them of such a station before they get to it they often pass it by. The filling station which is equipped with rest rooms and lets the traveler know it before he gets there adds to its business thereby.

Garages and service stations that one finds out in the country are not particularly well stocked or equipped to take care of the needs of tourists. The idea of carrying stocks of parts and supplies for a wide variety of cars has not been generally entertained. The answer to an inquiry for a part for a car not sold in a town usually is that there are no cars, or few, of that make in town and therefore no one carries any supplies for them.

When a cylinder head gasket was needed at Rolla, Mo., the information from the various service stations was that there were only two cars of the make in the town and no agency for it and of course no parts. No thought was given to the hundreds of cars of that make which certainly will pass over that great primary state highway within the next few weeks of fine touring weather. It is possible, of course, that there may not be another call for a cylinder head gasket for that make of car in that town in a year, and yet it seems that one service station, at least, out of the several there would see the vast possibilities in catering to tourists on a main highway and supply itself with a well selected stock of parts and supplies for all makes of cars that may be expected to pass in any number.

Such a stock would not necessarily require a very great investment. Only one or two of various items would suffice, but as these were used they would have to be replaced. The garage that undertakes to operate on this plan should have a good location, preferably on the highway, and should advertise prominently.

"Parts and Supplies for All Cars" would be a good line to stand out in bold lettering over the front of the building. If the same information could be put on one or more neat roadside signs on each side of the town it would help greatly. The time will come when very profitable business can be built up in this way. The proprietor will take into consideration the fact that the automobile tourist is in a

hurry and does not want to lose any more time than absolutely necessary. He will select his stock with the idea of having on hand at least one item of the parts or supplies most likely to be called for and will be quick to suggest a telephone or telegraph order for any part not in stock. The proximity of good jobbing houses to nearly all sections of the country makes possible the obtaining of almost any needed item over night. Where the part is not available and the tourist, being able to proceed, does not want to wait for it to be ordered it is often possible for the good service station to effect a temporary or emergency repair that will help the tourist along and yield some revenue for the shop.

The car needing a new gasket was driven into Springfield, Mo., before a service station was found that could supply the need. Here was an authorized station and a good mechanic. Here it was decided to have carbon cleaned out and valves ground, as the cylinder head had to be taken off any way. This work was done to the car:

Two cylinder head gaskets installed in place of the one defective one.

Carbon cleaned out.

Valves ground and valve tappets adjusted.

One new valve installed.

Oil drained and fresh oil put in.

One front wheel bearing taken up.

And the bill. It was \$7.35, for all labor and materials. There was the fault, if any, of this service station. The entire charge for labor and materials was less than the flat rate charge for labor alone on a valve grinding and carbon removing job as recommended by the factory. It is extremely doubtful if any profit was made on this job, and yet if the service station is to remain as a useful unit in the automotive business it must make a profit.

#### *Service Station Hard to Locate*

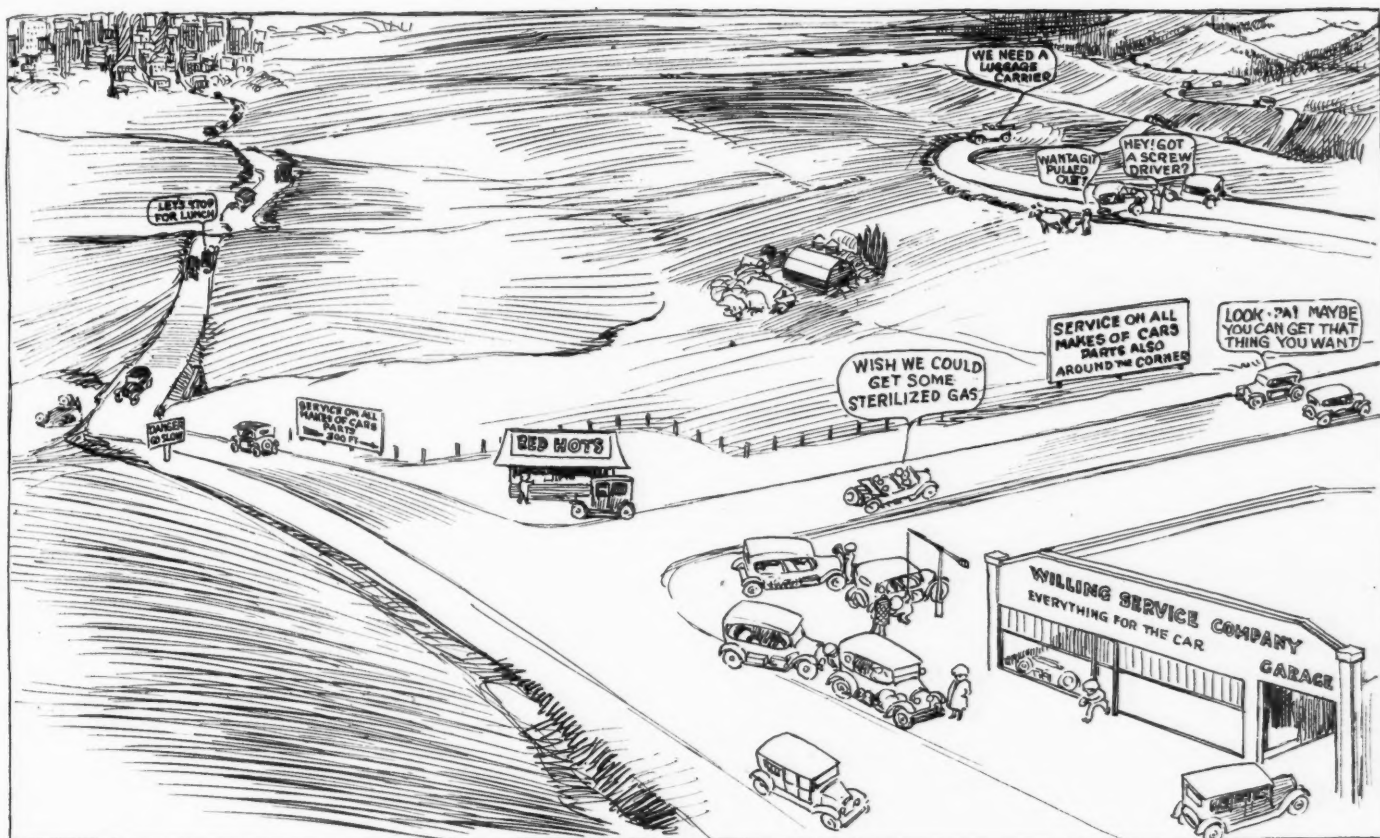
This service station was a bit hard to locate. The classified telephone directory showed no automotive concern with the car name as a part of its title. Resort was had to personal inquiry among the trade and directions finally led to the right place. It seems that if the firm title does not include the car name it would be wise for the dealer to buy a small space in the directory in the proper alphabetical position to display the name of the car or cars he represents.

This same difficulty was encountered when service was required on one of those devices used to keep the car from jumping too high after passing over a bump. No where in the directory could the name of the device be found, but again personal inquiry led to a well equipped service station where two competent mechanics were immediately ready to jump on the job. Finding this service station really consumed as much time as the performance of the operation.

Speaking of time lost, however, an experience in the city of St. Louis surpasses one's imagination. The accumulation of luggage made it desirable that some of it be carried on the running board. But who would ever be wild enough to dream that it would take all morning to get a device installed on the running board to hold the parcels from falling off? Every one knows that there are many good manufacturers making devices which can be quickly attached to the running board to hold luggage.

From the all night stopping place in the west end of St. Louis the car was driven to an accessory store on a main street. Only one article of the type required was in stock and it was too short. But the proprietor was accommodating and he was sure he could get it down the street. Failing there he went up the street and again returned





*Tell it to the tourists—they want to buy*

without it. Three automotive stores had lost an opportunity to make a profitable sale. The next stop was at a store several blocks away, larger than any of the others.

"We are out of them," said the clerk, "and that's the third call," he added significantly, appearing to address the remark to the proprietor. Here was given the address of a store that also does a local jobbing business. There, at the fifth place, the desired article was found, but by the time it was installed the morning was nearly gone. And just as \$3.50 was tinkling into the cash register the proprietor of the first store visited passed out of the stock room with a supply of half a dozen or so of the aforesaid articles and he smilingly remarked that he was not going to be caught napping again. "And that is two sales for me," said the proprietor of the well stocked store.

Now this store makes it a point to charge a reasonable fee for installation of equipment it sells. In this case the charge was 50 cents. But in quoting price the installation charge was not included, as it seems that it ought to be on any article than can be more easily installed at the store, where tools and experience are available, than by the purchaser himself. It was the proprietor's idea that price—the lowest price possible to quote—sells the merchandise and that the mention of the installation charge might kill the sale. He may be right, but on the other hand isn't there danger that the wet blanket thrown down by the "extra" charge after the deal is closed will do greater harm in keeping the customer from coming back again?

Here are only a few suggestions of the buying power and inclinations of the motor tourists. Here are outlined some of the difficulties he runs up against and some of the golden opportunities that the automotive merchants are neglecting. This summer a large section of the country has been one of unusual rains and storms, thus hindering cross country automobile travel. Roads have

been washed out and mud has mired many a car, but still they go. In the foothills of the Ozarks, New York meets California almost as often as Illinois greets Oklahoma, and a day's observation will constitute a review of practically every modern make of American automobile. As the fall months come on the roads will be at their best and motor travel is certain to increase.

The Illinois hard road program stands out as a monumental development in the middle west where up to now the hardest going has been encountered by those who would cross from coast to coast. Here one has the choice of two separate concrete routes between Chicago and St. Louis, and this summer alone more than 700 miles of paved highways have been laid down.

But that is only a beginning. Step through the great St. Louis gateway where the mighty Mississippi is bridged and one faces the famed mud of North Missouri or the hills and rocks of the South. But here a revelation awaits the motorist. A \$60,000,000 state road building program is under way. Miles and miles of broad graded highway, graveled so smoothly that it is velvet compared with concrete, stretch over the hills and valley. Not all linked up, it is true—many miles of bad primitive roads in between—but all a part of a vast system in which state and Federal government are cooperating. The finished sections will be joined up as rapidly as possible, and in the mountainous sections brand new roads are being built to eliminate the perilous grades, but still preserve the scenic beauty of broad curves and hillsides sweeps from which miles and miles of marvelous wooded valleys may be viewed.

Thus the lure of motor touring is growing and in the years to come the travel by automobile over the improved roads of the country will be multiplied many fold. The wise automotive merchant of today is preparing for that time.



# The House That Service Built



Front view of the house of Chas. J. Dempsey, Inc.

## *A Ford Story of Equitable Service and Profitable Sales*

By  
A. H. PACKER

**T**HIS is a story of service, of a few thousand dollars grown to three hundred thousand; a knockout in business; a story of value rendered and friends made.

"And service," said Charles J. Dempsey, Chicago Ford dealer, "is not a repair job. That is maintenance of a motor car. Service begins with the answer our telephone girl gives when she says, 'Charles J. Dempsey,' instead of 'Hello.' And service continues through the difficult task of exercising self restraint, while taking abuse for trouble the car owner has had; it continues through the used car department, the new car department; it explains the sales that are made to those never on our prospect list and it accounts to a great extent for the growth of our business in the past eight years."

"And our used car plan," continued Ray, the used car man, "is as good as it is novel, for it includes a money back agreement which we keep to the letter, which again makes friends and therefore business. I always used to think, when I contemplated buying a used car, that I would like to make some arrangement with the dealer, so that if the car did not turn out to suit me, I could pay him a fair amount for the use of the car for a short time and turn it back again, and that's exactly how we work our used car business. Three hundred and five cars sold in the last two months and only five or six came back. We charge a dollar a day for the time the car has been used, with a minimum of \$15 for a car sold for cash and \$25 for a car sold on time, and in this way we cover the cost of handling the car and at the

same time, the charge is not a burden for the purchaser."

Then the question was asked. "But how about the vacationers? Do many get a car to take a trip in and then turn it back again?"

### Few Cars Returned

"Oh, we had two or three like that, but we ask no questions. Just check up the car to see it is in as good condition as when we turned it over to them. It pays, even if some do come back, for we have been able to establish confidence in used car buying, a thing so sadly lacking in the thoughts of many. At that we are not taking much chance of having comebacks for each car is checked mechanically, loose bearings are taken up, rings replaced if cylinders are pumping oil and in many cases the car is refinished. That may sound like a big job but we have a system of using a chemical to get the paint off and a paint sprayer for refinishing again so the actual expense to us is slight, while the increase in value of the car, and its attractiveness to the customer are greatly increased."

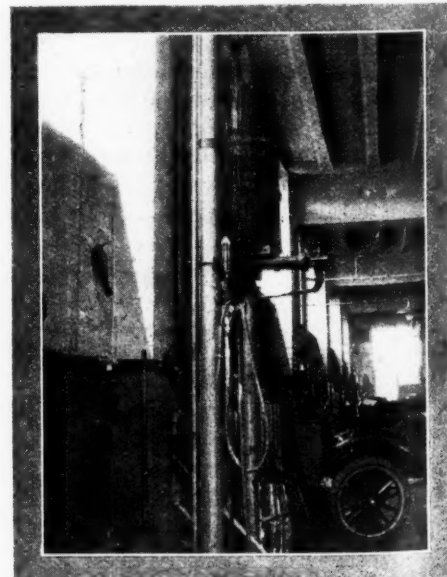
"Then there is another angle to the used car plan we have adopted, for of the few who brought cars back, three bought new cars, and that didn't make us mad a bit, so you see it works out fine all around."

The system for removing paint which is in use in the Dempsey service station is both simple and efficient, the tank for the alkali solution being mounted on the wall near the wash rack. Under the tank is a burner for heating the solution, while a thermometer is used to determine the temperature which is kept at approximately 200 degrees Fahr. while the paint

is being removed. A hose and nozzle are used, the nozzle being just a piece of copper tubing flattened at one end, so as to send a thin flat stream of the solution over the surface.

The stream of chemical is started at the top of the body, just under the upholstery and is allowed to flow downward. After the first layer of fluid has flowed off another is used all around, this being followed by a third. After the third bath, no sign of paint is visible and a wash with cold water finishes the job of preparing the car for the spray paint. The alkali solution used is, however, ineffectual on baked enamel.

Maintenance work is handled in the



The business end of the paint remover is the tank with the hot alkali solution



new building, which shows up in one of the illustrations. It is across the alley from the building in which offices and sales rooms are located and extends through to the next street. Here cars come in through wide doors and line up at the left where service salesmen interview the owners and write up the orders. One service salesman is assigned to two stalls and every effort is made to give prompt attention to each job. Cars on which little time will be required are kept on the first floor and go to a portion of the shop partitioned off, where the short jobs are taken care of. The owner is then asked to wait in the office and the mechanic advises him when the job is ready.

Quick service jobs include generator repair, tire and wheel work, radiator repair and battery work, and any other work which does not take an excessive amount of time, the exact division of the work being left to the discretion of the floor manager, who sends cars either up stairs or to the quick service department. Generators are taken apart while the owner waits and the cost of needed parts determined. Another generator, rebuilt and guaranteed, is then installed, there being a flat rate charge for the labor. In this way the car is held for only a short time.

In the case of radiators, the removal work is done downstairs and the radiator is sent up to the radiator shop. This is a matter of two hours in many cases, some jobs being done in less time. If the customer is in a great hurry he can have a loan radiator installed. There is no charge for this except for the extra labor of installing and reinstalling which costs him \$1.50.

#### The Way Wreck Jobs Are Handled

Where wrecks are to be taken care of, the effect of their appearance on sales prospects is first considered, and unsightly jobs which might instill fear in the thoughts of car owners, are gotten out of the way as soon as possible. The



*Thorough checking of new cars sells the owner as well as the car*

actual repair work is then carefully figured and if the cost is high, the possibility of the owner trading the car in on a new one is presented. Even in a wrecked condition a fair trade-in allowance can be made, for the cost of repairing for resale is not as great as for repairing for the original customer.

Where a wreck job is to be put in shape, there is another point to watch, for in some cases, even where the owner has agreed to the work and its cost, it may be found that he has decided to "crawfish." He may defer calling for the car when ready, and stall along on one pretense or another, actually intending to leave the car in the dealer's hands rather than pay the cost of repairs. This is a point requiring a great exercise of discretion, a sort of third degree test for the service superintendent.

To the business of mechanical repairs, the wash rack adds its share of profitable maintenance, for the service salesman can often get a wash job included with the rest of the work being done. Orders which include washing are listed on a chart at the wash rack, the time that delivery is promised being noted. This chart is carefully watched by the boys who wield the hose and sponge, for they are held responsible for promises broken. The result of this ruling is that they are ever on the alert, and as the time gets short for some job or other to be ready, a wail of protest goes to the superintendent if the car is being delayed in the mechanical department.

#### To Keep the Cars from Slipping Away

Whether the shop is large or small there is always the danger that jobs will be taken away by the unscrupulous without the work being paid for. To overcome this condition as much as possible a chain is used at the exit door, and a special man is assigned to watch this door and let cars out. The owner of the car then presents to this man his exit ticket, a ticket being given him no matter whether extensive work has been done or the car has been merely inspected. In

the latter case, the service salesman makes out a ticket which is taken up as the car leaves. In a small shop this method might be varied, the tickets being perhaps superfluous but the chain might well be used to prevent too hurried departure.

The doorman has also another duty to perform, for he is custodian of the rack of oil bottles, which conspicuously displayed at the exit, results in the receipt of many a dollar which might otherwise go elsewhere. These quart bottles are checked up at the close of the day and the doorman accounts for them either in stock or in money.

#### Interpreting the Guarantee

Treatment of customers has at least two angles, one—that of seeing that the shop is not victimized, and the other that of seeing that the owner gets a fair deal. Here the fair interpretation of the guarantee is a means of determining proper relations between dealer and customer. To illustrate—a new sedan was purchased, the usual 90 day guarantee applying. Four months later, after being driven through all sorts of weather the car was brought in with the complaint that the top material was coming loose. The car was out of the guarantee period and the usual answer would have been to that effect.

The service superintendent has learned, however, that it is much better to save the conversation and get all facts first, so he investigated a bit and found that the material had not been properly installed in the first place. Tacks has been placed so near the edge of the fabric that they easily pulled through at the edge. The job never had been right, and they made good on it.

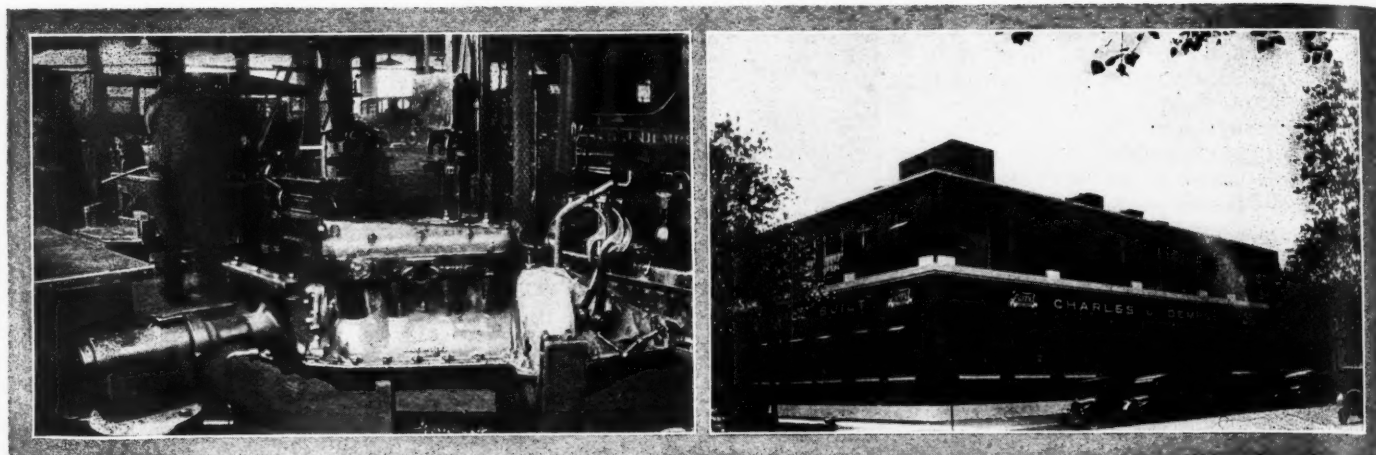
The question was then asked as to what disposition would be made of the part and the customer where a lamp bulb purchased burnt out as soon as placed in the socket.

"That all depends on the appearance of the lamp," was the reply. "If it is all black, it shows excessive voltage, something on the car which burnt the



*Suitable fixtures for holding the cylinder block speed up work on the bench*





*The fixture at the left is small, but adequate, for it holds the engine in practically any position; right, the shop end of "The House That Service Built"*

filament. On the other hand if it is white inside, it shows the bulb leaked air which caused the filament to burn. Then, in the case of the white bulb a new one would be given without question, for such a bulb, even though not guaranteed by us, was worthless when sold and it would be unfair to ask money for a worthless object. In fact, we can even get our money back from the lamp company if the trouble is as obvious as that."

Such fair treatment of customers is typical of this shop and of any shop to which customers will come for miles because of the kind of work done and the spirit in which it is executed.

This spirit of rendering good service is reflected not only in the success of the institution as a business but also in the attitude of the men as individuals, for as the whistle for the noon hour blew and the men started to clean up, many of them were whistling, a symptom not observed where grouches are the rule and resentment toward boss and customer is openly evident or furtively expressed.

And then there is another reason for men at Dempsey's get what they deserve. Piece work compensation is not the basis, but record is kept of the productivity of each man, and in proportion to the work he does is his pay increased. Then there are little things, too, the towel supply for example, and liquid soap supplied by the management, small items but appreciated by the majority.

#### Protecting the Workmen

"And the good men," observed the superintendent, "are a shop's best assets, hard to get, but worth going a long way to keep. That's one good reason for having guards on the belts and safety devices on machinery. Even if we are protected by insurance and from a humanitarian standpoint would not wish to have anyone hurt, there is the other angle of keeping the men at their best efficiency, and freeing them from the thought that they may get hurt in their daily task.

Good men alone, however, do not make profitable maintenance possible. Good equipment also is needed. Here no at-

tempt has been made to put in equipment designed for a number of jobs, and even in the smaller shops it is probably better to get equipment which is the best obtainable for a certain job. Then when profits make another purchase advisable get another piece of equipment for some other operation until the shop is well equipped.

#### The Piston Lapping Machine

In a large shop of this sort things have been done which might not be possible in smaller places, but they point out the need of the right tools for the job. A back geared drill press, for example, for which but little work was available was converted into a lapping machine. A special extension like a mammoth drill was installed, except that at the end of the extension was an eye like the upper end of a connecting rod. To this eye the piston to be fitted would be attached, a rod of wood being used in place of the piston pin so that if the piston should bind, the pin would shear and no harm would be done.

A special H shaped hoisting jig, for example, is used to lift commercial bodies and this has cut the cost of body transfers from some \$12 to about \$1. Formerly the whole shop force was demoralized every time a job of this sort had to be done, for it required the muscular effort of nearly every one in the place. Now it is a simple task for two men. Motors are carried around from place to place by a monorail, this being comparatively inexpensive to install and a worth while piece of equipment even for the small shop.

Men working on engines do not have to "step on it" to hold the work in place. The drivers of the cars do the "stepping," but the men use suitable engine stands which make quick work possible and save their cost many times over. Large tools do not mean thorough equipment, for small items are often equally advantageous in doing work right. Just the matter of keeping track of the valves on a regrind job means by old methods notching each valve a certain number of times to keep track of its place in the engine. A better way is to use a board

with holes in it. The valves are then placed in the hole that corresponds to the place it would have in the engine, and there is no danger of getting it misplaced.

One stunt is used in the Dempsey shops which may be new to many. It is the use of an A. C. ammeter in the circuit of the burning in machine for the purpose of determining when the job is right. Guess work is the method most commonly employed, but with the ammeter guess work is eliminated after the proper reading has been determined. It is a well known fact that with any electric motor, more current will be drawn as the load is made heavier. It is also known that as the load becomes less the motor will speed up somewhat and will take less current, and this is the basis for using the ammeter.

When the meter was first installed, one of the best men, expert at this work was asked to judge when the burning in job had run long enough and the meter reading was noted. After that the inexperienced men could stop the work at the right time as well as the most skilled man in the place. Not only does it tell when to stop the burning in process, but it shows if the bearings are not tight enough at the start. When starting, the meter needle should bang off the scale, and if it does not it shows bearings to be too loose.

#### Inspection of New Cars

In the matter of checking up new cars for delivery the shop co-operates to keep cars sold. Inspection is most rigid and items to be taken care of are all listed on a card, which contains spaces where the man taking care of each detail signs his name. These cards are stock items furnished by a printing concern specializing on forms for automotive establishments and the items they mention cover everything from water in the battery and grease in the bearings to inspection of door handles and locks.

And so in both sales and service, every possible human effort is made to give value for the money, to keep old business and friends and attract new ones.



# They're Coming! They're Here!



## *How a Carefully Coordinated Teaser Campaign Helped Nash Dealers Throughout the Country Attract Visitors to See the New Models*

The illustration above shows how show windows of Nash dealers were painted several days in advance of the time set for the formal announcement of the new Advanced Six and Special Six models. The building is that of the Doan Motor Co., Toledo, O. Below is a photograph of a dealer's show window after the paint had been washed off and the new models placed on display. This store is that of the Martin Nash Co., Atlanta, Ga.

**I**N preparation for the introduction of the Advanced Six and Special Six series of Nash automobiles the Nash Motors Co. worked out a very effective teaser campaign for the use of its dealers throughout the country.

Several days in advance of the showing of the new models the show windows of the dealers were painted on the inside with a bright blue opaque water color that washed off easily. In some cases streaks of this blue color were allowed to run across the sidewalk, tending to still further attract passers-by. In white on the blue background was painted the message—"They're Coming." The color combination was such that the windows stood out boldly and could hardly fail to attract the notice of any one who passed nearby.

Newspaper advertising was also included in the teaser campaign. Single column ads with the heading, "They're Coming," were run in local newspapers over the dealer's name.

On the morning of the introductory day the showroom windows were washed clean of the paint and only at the top was a broad band of blue with the white lettering, "They're Here! The New Advanced Six Series! The New Special Six Series!"

Dealers reported thousands of visitors as a result of this method of announcing the new models.





# Engineering for the Service Man

*Consumed Energy of Fuel and Battery Must Be Compensated for in Natural Way*

By A. H. PACKER

"A MAN had a dollar, he spent a nickle calling up his girl, bought a railroad ticket for thirty-five cents and a box of candy for seventy cents and then—"

That's an old gag they used to spring in school and when you heard it you would say, "Yes, but he only had a dollar." Then the other fellow would say, "But you don't understand, a man had a dollar, he spent—and so on" and the same thing would be repeated.

Impossibilities never happen.

You can not spend more out of a dollar than there is in the dollar, neither can you get more energy out of a storage battery than there is in it, nor more power out of an engine than there is in the fuel, and yet there frequently appear on the market specialties which claim to do wonderful things, yes, impossible things, and when you say "Yes, but, etc.," the magnetic salesman repeats his story, still without meaning and apparently without end, until you meekly give in and buy his patent dope, oil stock or whatever it is, or else exercise your intelligence and initiative to the point where you gently but definitely show him the exit.

Developments will continue in the automotive field, engines will develop more power, cars will operate better, batteries may have a longer life, but where a real improvement has been achieved there will always be a reason for it, readily explained and easily understood. At the same time there will come along with the real achievements, fake developments whose claims will appear to make the real accomplishments fade away into insignificance.

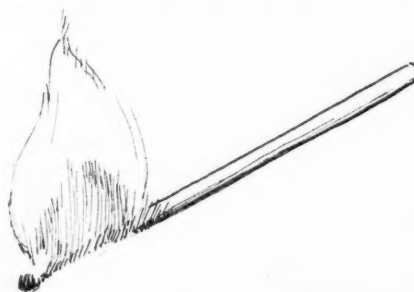
So insist on the reason. If the game is on the square, there is a reason easily understood.

Suppose we take a match and burn it. A chemical combination takes place, and we do not have to study chemistry to understand something of what is happening. In the air is oxygen and in the wood is carbon along with other things. What we call burning is a chemical combination between the oxygen of the air and the carbon in the wood. The carbon and oxygen join hands forming carbon dioxide and in doing this heat is liberated. The "di" part of the dioxide means "two" and signifies that two particles of oxygen have united with each particle of carbon. That's why the result of this chemical combination or combustion is called carbon dioxide.

If we smother a wood fire so that the wood does not have enough oxygen to burn properly we force each carbon particle to go on starvation rations and form

carbon monoxide, the "mon" part of it meaning "one," that is, one part of oxygen combined with one part of carbon.

Now there is a very definite and fixed relation between the heat that we get and the amount of wood or carbon containing material that we use up in this way. For every unit of carbon dioxide formed there is a certain amount of heat produced, NO MORE AND NO LESS, and in all the years that chemists have labored



*The burning match having a definite amount of wood in it produces just so much heat and no more*

they have not been able to change these natural laws. Then who would say that there is a way to make wood give off more heat. There is only so much heat energy there, and as in the case of the dollar, you can not get out of it more than was originally in it.

Of course, if the wood had been imperfectly burned so as to form carbon monoxide and we could in some way give it more air to make it burn better and combine more completely, then naturally we would be liberating more heat. The same thing is true in burning anything else, as gasoline, for example. There is just so much energy in the fuel which we liberate when the spark occurs and no device can possibly get out more than is there.

At the same time, if the fuel had been burning imperfectly, we could possibly improve combustion to get the maximum energy that was in the fuel but we could never get more out of the fuel than was originally in it.

We all know how heat expands, and in the case of the gasoline engine we are using this characteristic of the burning fuel to push a piston and produce mechanical power, but the principle is the same, for the energy in the fuel is a fixed item and the best we can do is get it all. Past that we can not go.

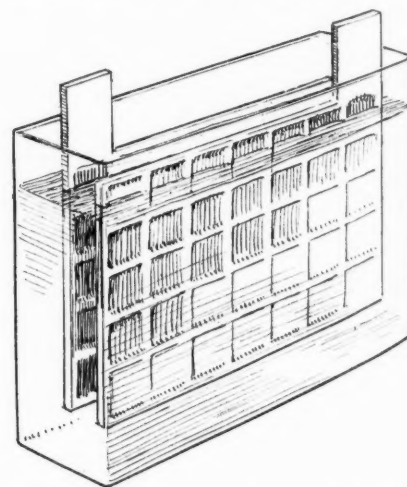
In the case of the storage battery the action is of the same general nature. We start with lead plates made in such a shape that they support spongy lead on the negative plate and lead oxide on the positive plate. Then we put them in sul-

phuric acid in which they "burn" or are consumed, producing in this case electrical energy instead of heat energy. Then instead of producing ashes as the wood does, they produce their own kind of ashes which we call lead sulphate.

When the piece of wood is all consumed we say it is burnt up, but when the battery plates are "burnt up" (changed to sulphate), we say the battery is discharged. If we could get the ashes and smoke together and change them back into wood and air again we would have a reversible process, and as heat has been liberated in the original combustion we would apparently have to apply heat in the process of doing this.

This is not possible in the case of the wood, but is possible in the case of the battery. But we must restore all of the ingredients. Therefore, as we got as the result of combustion or chemical action in the battery, two sulphated plates and some electrical energy, so in recharging, we must use electrical energy by sending a current through the battery to restore the plates to their original condition.

In the good old days we talk about, when we had no steam heat and no bathrooms, we used to coast down hill in win-



*The amount of electrical energy given out is proportional to the amount of plate material changed to lead sulphate*

ter, but a time came—and quickly, when the ride was finished, and there was then no more riding until we had pulled the sled up the hill again.

There was no magic way of making the ride continue indefinitely. So with a storage battery, the down-hill process of discharging must be reversed and the elements lifted "up-hill" chemically before they can work again.



# The Silver Jubilee Shows

*Application Blanks and Space Diagrams for Twenty-fifth Annual National Automobile Exhibitions Are Distributed*

THE application blanks, contracts, diagrams and descriptive pamphlets for the Silver Jubilee Shows of the automotive industry have been mailed by the show management from the offices of S. A. Miles, 366 Madison avenue, New York City.

The twenty-fifth annual national shows of the industry are to be held in New York Jan. 2 to 10, and in Chicago, Jan. 23 to 31, 1925. The history of the national shows is practically the history of the industry and for this reason the show management has decided to commemorate the silver anniversary by extraordinary efforts to make these shows surpass all others in brilliance and noteworthy features.

The applications for first allotment of space at the two shows will close Sept. 27. As usual the exhibition space for motor vehicles will be allotted first to members of the National Automobile Chamber of Commerce, and all space for accessory exhibition has been assigned to the Motor and Accessory Manufacturers' Association for distribution among its members.

The New York show will be held again this year at the 258th Field Artillery Armory, Jerome avenue and Kingsbridge road, where it was so satisfactorily housed last year. In that building there is space enough on the ground floor for all exhibits, the accessories being assigned to one end of the vast hall and wall space along one side.

The Chicago show will be housed more favorably than ever before, through the completion of an addition to the Coliseum. This addition is on the north end and will be known as North Hall. By using this addition, and the Greer building adjoining the Coliseum on the south, it is possible for the show to be contained under one roof. This means the abandonment of the First Regiment Armory across the alley and down the street on Michigan avenue which for many years has been used to shelter the overflow exhibits of vehicles and accessories.

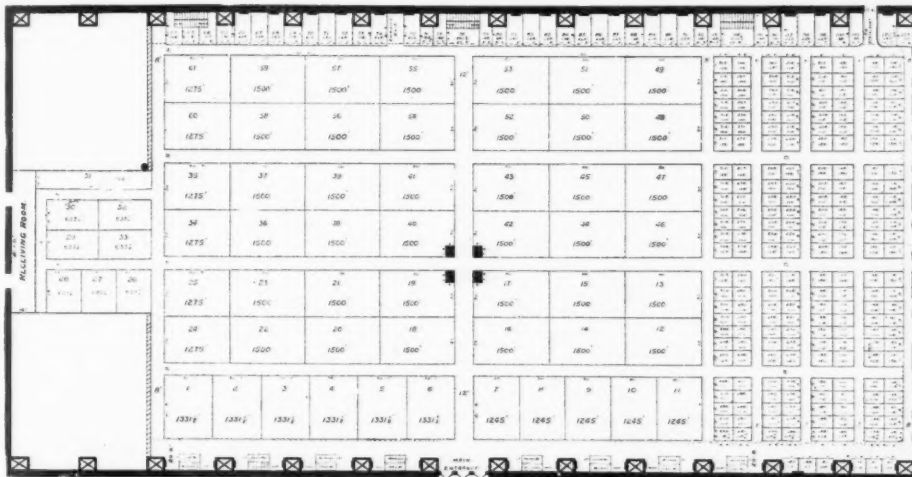
This arrangement makes possible the elimination of a very objectional feature of the Chicago shows in the past—the necessity for the spectators to tramp through a dirty, wet and cold alley in order to see all of the show.

The accessories at Chicago will be housed in the balconies of the main, south and north halls.

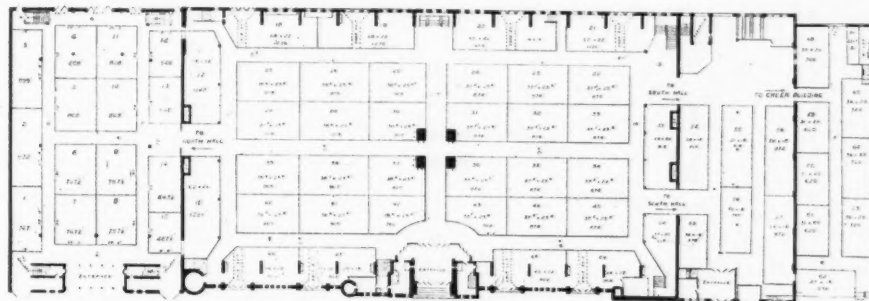
Unusual interest in the trade is expected to be attracted to these shows because of the inauguration of exclusive trade days. The shows are to open on Friday instead of Saturday noon as heretofore and admission Friday and Saturday will be limited to the trade. The doors will be first opened to the public

## SILVER JUBILEE NATIONAL SHOW DATES

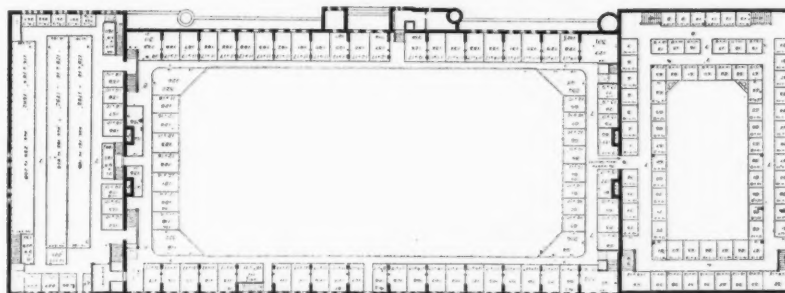
New York—Jan. 2-10  
258th Field Artillery Armory  
Chicago—Jan. 23-31  
Coliseum and Greer Building



Main floor 258th Field Artillery Armory where New York Show will be held



Main floor, Coliseum, north and south halls and Greer building where Chicago show will be held



Accessories section of Chicago show in galleries of Coliseum and north hall and second floor of south hall

Saturday night. This arrangement is intended to give to dealers, distributors, salesmen and others engaged in the automotive trade an opportunity to examine the exhibits at their leisure and without interference from the crowds that always attend the national automobile shows. It also will afford an op-

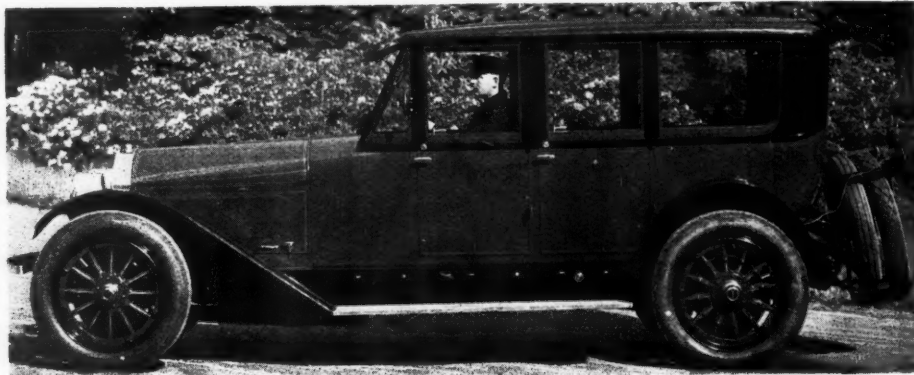
portunity for the trade representatives to talk under favorable conditions with representatives of the factories.

This feature of the shows will be watched with unusual interest by the management with the purpose of continuing it if it meets with the approval of the trade.



# Newest Locomobile Improved in Many Details

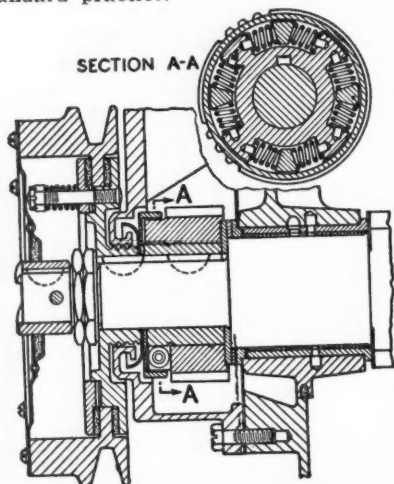
*Engine Power Increased and Frame Stiffened in Series 19,000—Aluminum Pistons and Full Pressure Lubrication Are New Features*



One of the new Locomobile closed models

Numerous improvements in details of design have been made in the Locomobile 48, chiefly with a view to keeping the car "like new" longer or making it possible to keep it so. In addition, the power of the engine has been increased, the frame has been stiffened, the fuel economy improved and factors tending toward unequal distribution and roughness in engine operation have been eliminated. The new series is known as the 19,000.

The six-cylinder Locomobile engine now develops as high as 107 hp. on the brake at 2150 r.p.m. and the four passenger stock car is said to be capable of a speed of 76 m.p.h. The compression pressure has been increased slightly, the compression volume now constituting only 23 per cent of the total, instead of 25 per cent, as previously. Catalytic, a process consisting of covering the surface of the combustion chamber wall with a preparation having catalytic properties similar to those of the material used in Wellsbach gas mantles, is now standard practice.



Cushioned camshaft gear drive pinion

Aluminum alloy pistons cast in permanent molds have been substituted for cast iron pistons, whereby the weight of the piston with rings has been reduced from 4 lbs. 6 oz. to 2 lbs. 8 oz. These pistons are of the constant clearance type and have the piston pin bushings cast in. Ordinarily these bushings will wear as long as the pistons themselves, but should the wrist pins develop play first, this can be remedied by reaming the bushings for an oversize piston pin. The bushings are helically grooved on the outside in opposite directions, so they are securely anchored in the piston bosses.

Four narrow piston rings ( $\frac{1}{8}$  in.) are used, all above the piston pin. The piston is formed with three substantial interior flanges, one at the open end, a second at the bosses and the third directly below the ring belt, being separated from the latter by the circumferential slots. The design of the piston is such as to make it possible to operate with a skirt clearance of 0.0035 in. on a piston of  $4\frac{1}{2}$  in. diameter.

The cylinders are now lapped to obtain a better wearing surface from the start. Each cylinder of the twin block is lapped separately for six minutes, 0.0003 in. of metal being removed, the cylinder block being slowly rotated around its axis during the process while a dummy piston is being reciprocated in it.

The top half of the crankcase remains of bronze, but the lower half, which is an aluminum casting, is now made of heavier section and also is ribbed, and it is tied to the top half by an increased number of bolts, so that the rigidity of the crankcase has been materially increased.

Lubrication is now entirely by force feed. The dry sump system has been retained, whereby the oil collecting at the bottom of the crankcase is drawn from both ends by a pump and delivered

into the sump, from which latter the oil is forced to the different bearings by another pump. Through an oil distributor pipe leading the length of the crankcase, oil is delivered directly to each of the seven main bearings; thence, it passes through holes drilled in the crankshaft to the crankpin bearings and through tubes extending up the connecting rods to the piston pin bearings. The bearings are cut with circumferential oil grooves, which are slightly inclined to prevent the wearing of a groove on the shaft but not sufficiently inclined to interrupt communication with the oil hole in the shaft.

A rather interesting method is employed for the control of the oil pressure in accordance with the load on the engine. Located on top of one of the camshaft gear housings and communicating with the forward end of the oil distributor pipe is an oil pressure control valve. This valve is held to its seat by a coiled spring which is located inside a Sylphon bellows. The inside of the bellows communicates through a small bore tube with the inlet manifold, the tube being carried into the center of the manifold and having its end turned back, so as to prevent liquid gasoline in the manifold from getting into it.

If the control valve were subjected to the pressure of the coiled spring only, it would tend to maintain the pressure on the oil constant, causing the pressure relief valve to open when a certain pressure had been reached. Practically this same pressure will be maintained on the oil, in the present case, when the engine is working under considerable load, when there is very little vacuum in the manifold. But when the engine is throttled down and there is, consequently, considerable vacuum in the inlet manifold, this vacuum is communicated to the sylphon, which tends to contract, counteracting the spring, with the result that the relief valve will open at a lower oil pressure. The advantage resulting from the use of the Sylphon for this purpose is that there is no communication between the oiling system and the inlet manifold, so that no oil can get into the manifold.

The pinion on the crankshaft meshing with the two camshaft gears is now mounted loosely on the shaft and driven through a flexible coupling consisting of a jaw coupling the driving faces of which are separated by coiled springs. The object of this is to prevent or relieve shocks to the camshaft gearing, resulting from torsional flexure of the crankshaft.

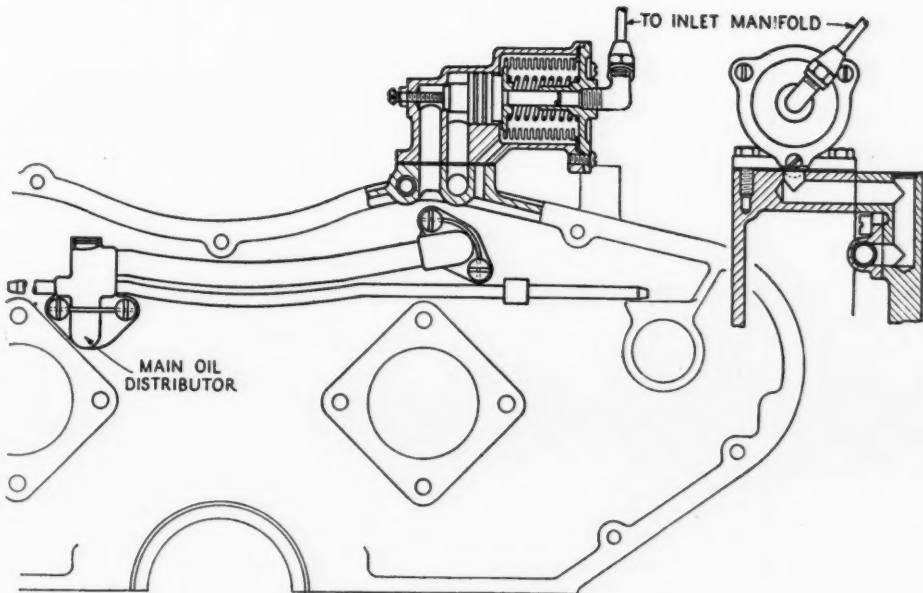
A Lanchester vibration damper is used



on the crankshaft to prevent the building up of torsional vibration due to synchronism, which feature, however, is not new.

Cobalt-chrome steel exhaust valves are now used; the width of the seats of these valves has been reduced from 5-32 to 3-32 in. and the lift increased from  $\frac{3}{8}$  to 11-32 in. Felt lubricators are now provided on the exhaust valve stems. These keep the valves covered with a film of lubricant and prevent corrosion and sticking.

The cams are substantially of the constant acceleration type, with slightly hollow flanks, and have unusually long ramps, which latter lift the cam followers at a constant rate. The inlet valve opens 6 deg. before dead center and closes 46 deg. past dead center; the exhaust valve opens 47 deg. ahead of dead center and closes 5 deg. past dead center. This timing is rather unusual, as the inlet and exhaust periods overlap to quite an extent. The inlet and exhaust cams are identical and the valve periods therefore are equal. A clearance of 0.002 in. is allowed on the inlet valves and 0.004 in. on the exhaust valves.



Oil pressure relief valve and connections on new Locomobile

the slots very much shorter, and the plate is now made flat and is set flush with the floorboard. Formerly the ball head of the gear lever had to be depressed before the reverse gear could be engaged, but this has now been rendered unnecessary by slightly offsetting the low gear and reverse slots, so that, coming out of the low gear slot, the lever has to be slid farther toward the left before it will enter the reverse slot. The stuffing boxes on the transmission bearings have been replaced by lead screws. The speedometer drive is now taken from the rear of the transmission through a bronze driving and a steel driven helical gear.

The frame section has been increased in depth by 2 in. at the middle, all other dimensions remaining the same. A removable torsion bar has been added in front to increase the rigidity of the frame.

One of the important changes is the provision of automatic take-ups for both radial and end play in the spring shackles. A hollow conical plug of hardened steel is set into each end of each shackle link, being clamped in position by a bolt in the link. These plugs bear in hardened steel bushings inserted in the spring eye, one from each side, with a cork washer between them so as to form an oil seal. The shackle bolts pass through the hollow conical plugs, and a flat spring curving over the bolt lug of the shackle link is threaded over their ends and put under about 200 lbs. pressure by the shackle bolt nuts. The angle of the conical plugs (22 deg. 30 mins.)

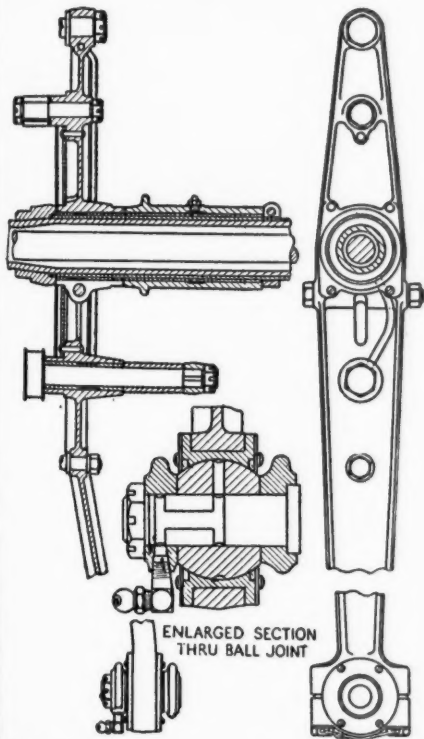
is such as to prevent freezing of the bearing surfaces and the spring keeps the surfaces in contact at all times. At the forward end of the front springs there is no shackle, and at this point provision is made for end play adjustment.

The radius rods which have been a feature of the Locomobile cars from the beginning, have been retained, but changes have been made in the design at both ends. These rods were formerly adjustable for length at their forward end and had a universal connection to the frame there. The adjustment for length has been done away with as unnecessary in the new design, and the universal connection has been redesigned so as to give increased bearing surface and better protection against the entrance of dust. A hardened steel ball is fitted over the pin of the joint and has a bearing in a bronze bushing fitted into the end of the radius rod, dust washers and retaining plates being fitted to the ends of the bushing.

At the rear end the radius rod is now clamped to a sleeve which surrounds the axle tube and extends through the spring saddle.

The Zerk system of chassis lubrication has been standardized.

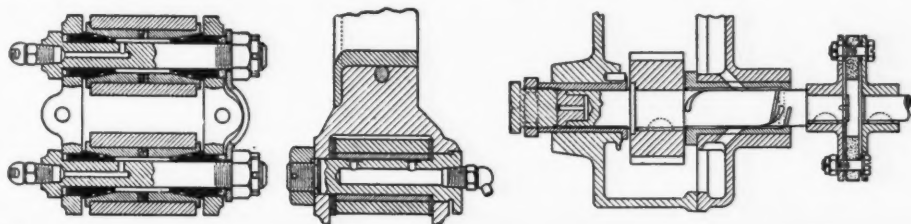
In the future the Locomobile company will market only a single chassis, eliminating the variations offered heretofore, which related to steering column position, gearshift lever position, pedal position, fenders, running boards and tool compartment. The steering column is now made adjustable as to angle of rake, being trunnion-mounted.



Radius rod with improved front and rear joints

The pump and magneto shaft gears are now provided with means for adjusting the end play. A hardened steel button is inserted in the end of the shaft, and a set screw with lock nut is screwed into the end of the bearing. To adjust the end play, the set screw is turned up tight and then unscrewed slightly to give about 0.001 in. clearance, after which it is locked.

With the object of making the gear shifting easier and rendering it more quiet, the shifting mechanism and gate have been redesigned. The gate or slotted plate has been placed closer to the axis of the gear lever, which makes



Left, spring shackle with automatic take-up and front spring horn with hand adjustment; right, end play adjustment for water pump drive on Locomobile Series 19,000



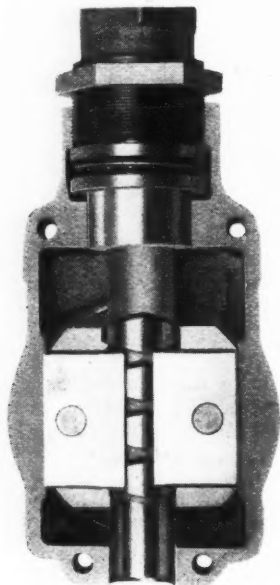
# A New Lavine Steering Gear

*Unique Features of Construction Make This Gear Applicable With Balloon Tires and Facilitate Handling Gear in Traffic*

THE outstanding features of the new series Lavine steering gears recently brought out by the Lavine Gear Co., Milwaukee, consist of the following five points:

1—Greater leverage when the front wheels of the motor vehicle are turned in the extreme right or left position.

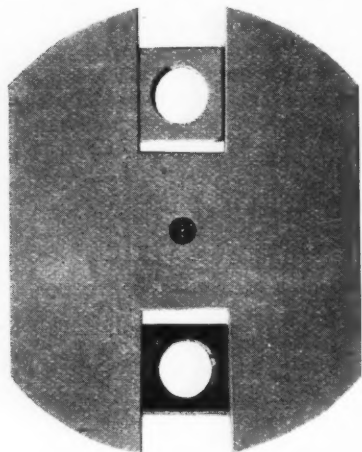
2—Balloon tire equipment. Consideration has been given balloon tires so that



*This shows the new series Lavine steering gear with the sliding head in the mid-position. The large thrust bearing at the top of the gear replaces the smaller bearing at the lower end of the housing*

enough leverage is available to satisfactorily handle cars equipped with large section tires.

3—Traffic conditions. Thought has



*The trunnion of the Lavine gear showing the sliding blocks approximately in the position they occupy when the drop arm of the gear is in the mid-position*

been given to the fact that traffic conditions make it imperative that a driver be able to swing a vehicle to the right or left quickly when this is necessary.

4—Thought was given in designing the gear to eliminate any tendency for premature wear at any point.

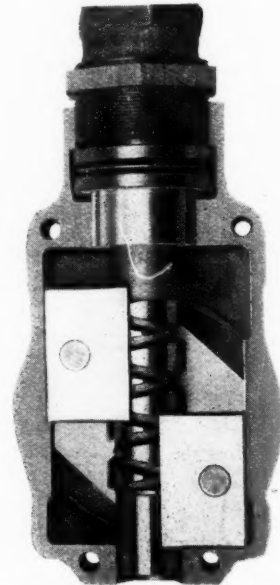
5—The gear is made with an adjustment that takes up lost motion in the steering wheel as well as the up and down motion of the worm shaft.

In general the design of the gear follows that of the former Lavine steering gears, in that it comprises a sliding head actuated by a worm shaft. The essential change in the new gear over the old is that the pins supporting the trunnion blocks instead of being in the inner end of the trunnion shaft are now attached directly to each half of the sliding head. The advantage of this is apparent because it readily will be realized that as the trunnion shaft is turned in the extreme positions, the trunnion blocks are pulled outward from the center of the trunnion shaft increasing the leverage.

By having the trunnion pins in the sliding head the radial travel of the pins as in the former type of gears is eliminated and the pins travel in a lineal direction, thereby keeping the forces balanced. The ratio of reduction with a  $\frac{7}{8}$  pitch is 9 to 1 at the start or the mid-position of the gear and 15 to 1 at the finish when the drop arm has traveled 40 degrees. With a  $\frac{3}{4}$  pitch the ratio at the start is about 10.5 to 1 and 17 to 1 at the finish with the same amount of travel for the drop arm.

The housing is made of malleable iron and has the trunnion shaft directly in the center. The case is very easily assembled or disassembled by removing four bolts. The construction is such that when the trunnion shaft is in normal position the end play is taken up or the thrust is relieved by a recess in the housing against which surface the trunnion bears. A change has been made in the location of the ball thrust bearing as well as the size of the latter. Instead of the small bearing at the bottom of the housing a large bearing has now been placed on the top of the shoulder of the worm shaft. This bearing has 15  $\frac{11}{32}$  steel balls to take the thrust as well as remove the friction between the adjusting screw and the worm. The worm is cut with right and left hand threads, crossing each other and running in two bearings known as the upper and lower bearings of the housing. The worm is made of 1045 S. A. E. steel heat-treated and ground.

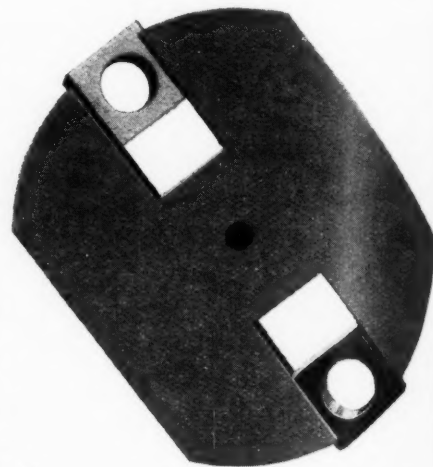
A feature of the trunnion blocks consists in making them with rounded surfaces where they engaged the slots in the trunnion. The advantage of this is that a universal ball joint action is secured which naturally offsets any dis-



*Here the sliding heads are in the extreme position. This also shows how the trunnion rides in a recessed portion of the housing to take up end thrust*

advantages that might occur through misalignment.

There are three threads on the sliding heads and worm in mesh at all times,



*Here the sliding blocks are shown in position when the trunnion shaft is turned in the right or left extreme direction*

and owing to the large bearing surfaces and equally distributed bearing surfaces, it is stated that this gear will not wear

(Continued on page 21)

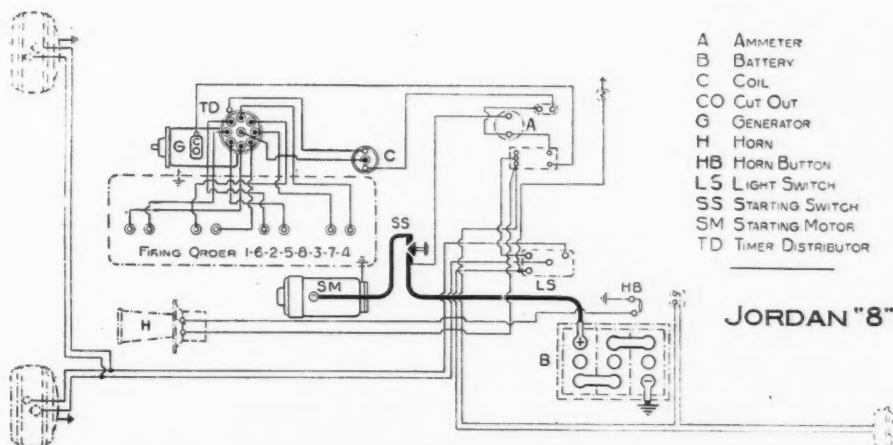


# Electrical System on Jordan Eight

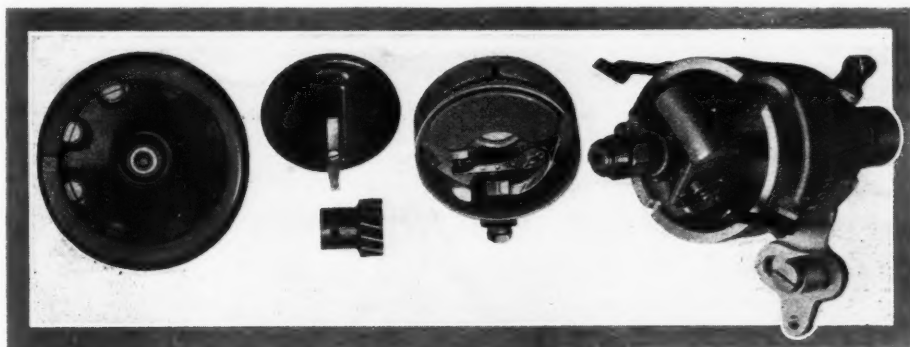
ON the Jordan eight cylinder car the American Bosch electrical system is used, a wiring diagram of which is shown here. The negative terminal of the battery is grounded while current from positive battery goes through the starting switch to the starting motor, this motor using a Bendix drive on the fly-wheel but containing in itself an additional gear reduction. A small wire on the battery side of the starting switch carries current to the ammeter through which current flows to the circuit breaker. Current through the circuit breaker goes to the lighting switch and to the horn and stop light circuits. A connection from the circuit breaker also goes to the cut-out mounted on the generator at the front right hand side of the engine.

The ignition unit is mounted at the rear of the generator, the shaft turning at one half engine speed. The generator is flange mounted and driven by means of a laminated flexible tongue coupling. It may be removed from the engine by removing three screws which go through the flange. Mounted on top of the generator is the cutout and just in back of the cutout is a fuse in the field circuit of the generator. This fuse is designed to burn out in case the battery becomes disconnected from the generator while the engine is running. Without a fuse in the circuit there would be danger of burning out the field windings of the generator, but with a fuse the windings are protected.

Adjustment of the generator output is accomplished by shifting the third brush, this being controlled by a screw on the outside of the generator. This screw



Wiring of American Bosch system on Jordan Eight

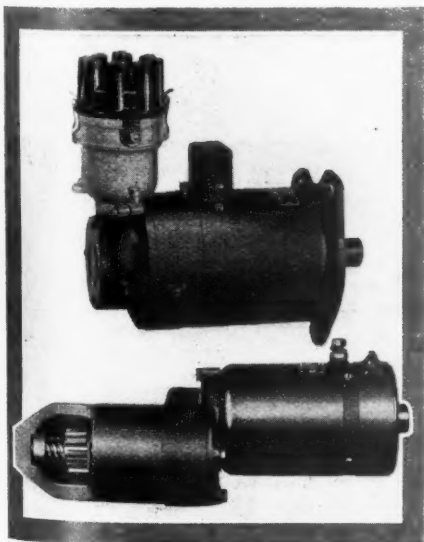


Exploded view of ignition unit showing governor which automatically advances the spark

carries at its inner end a pinion which meshes with gear teeth cut in the third brush rocker arm. In this way turning of the screw at the outside of the generator advances the brush or moves it against armature rotation. At a speed of 1,200 r.p.m. the generator should develop from 16 to 18 amperes at eight volts. Oilers are provided at each end of the

generator, but oil should be applied sparingly, only two or three drops being used each 500 miles.

Advancing of the spark is accomplished by means of the governor in the ignition unit, as shown in Fig. 4 where the various parts of the ignition unit are displayed. For slight adjustment of spark timing hand control is also provided.



Upper, the flange mounted generator carries the cutout and the eight-cylinder ignition unit on the Jordan Eight; lower, the starting motor contains a reduction gearing in addition to the Bendix gear drive at the flywheel

## NEW LAVINE STEERING GEAR

(Continued from page 20)

faster in the mid-position than it does on the extremes. Lubrication is effected by the action of the sliding heads which pumps the lubricant under pressure throughout the bearing surfaces.

Aside from the changes at the lower end of the gear the rest of the mechanism remains substantially the same as to spark and throttle control, tubes, etc. The ball arm is fastened to the trunnion shaft by means of a tapered and serrated portion of the shaft and also a nut. The machined and ground surfaces are held to very close limits throughout the gear. For example, the clearance between the curved seats between the trunnion blocks are held to a plus .005 and minus .0000.

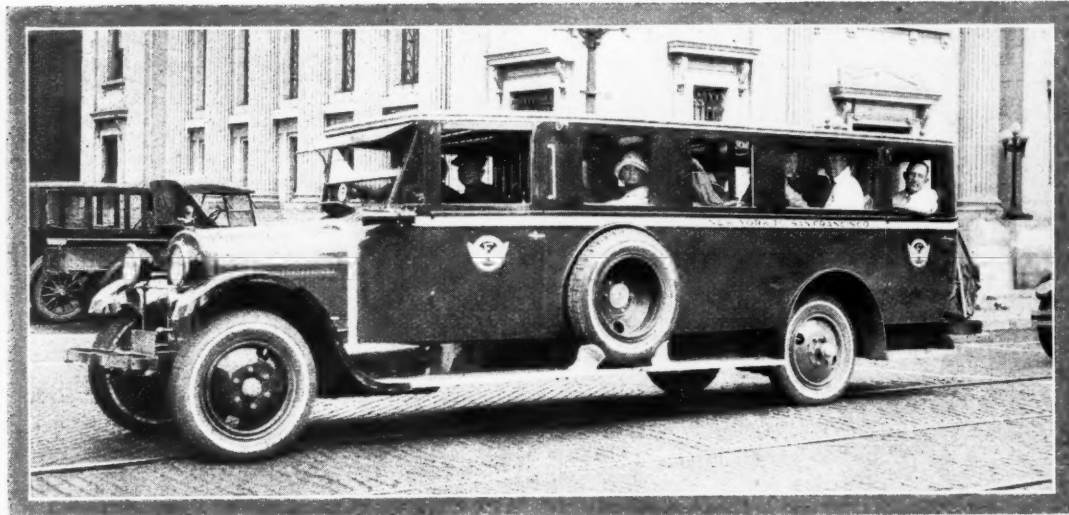
The new steering gear is made in different sizes to meet the requirements of every type of motor vehicle including motor busses.



Any chance for misalignment of the sliding blocks and trunnion are overcome by the rounded surfaces in the recesses of the trunnion end of the blocks

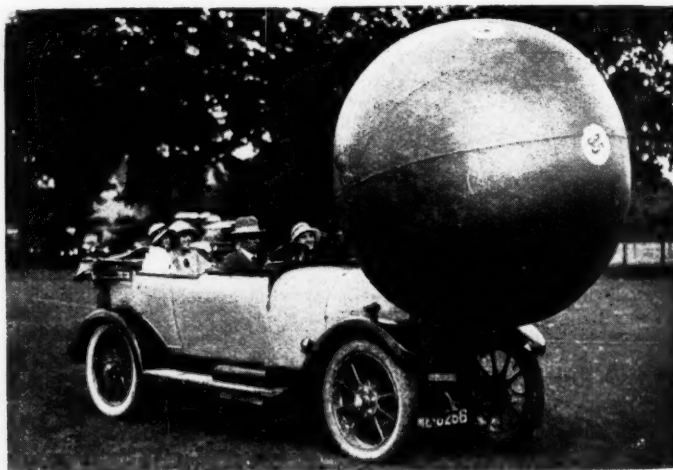


# MOTOR AGE'S PICTURE PAGES



Reo sedan bus at Michigan City, Ind., en route from New York to San Francisco. It left July 23 and the crew carried a message of greeting from the acting mayor of New York to the mayor and citizens of the California metropolis

Breaking an axle at 60 miles an hour is no joke, but in this case the driver was uninjured, the car fortunately keeping the road. The photograph was taken a moment after the breakage. Note the wheel in the air



Motor pushball would seem to be close to the ultimate in thrills. Such an affair was staged recently by the British as the feature of the Gymkana run of the Middlesex County Auto Club



These automotive veterans were presented with gold service pins by President M. E. Forbes of the Pierce-Arrow Motor Car Co. in recognition of a quarter century of fidelity. It seems that the first product of the company was bird cages. Some versatility we venture to remark



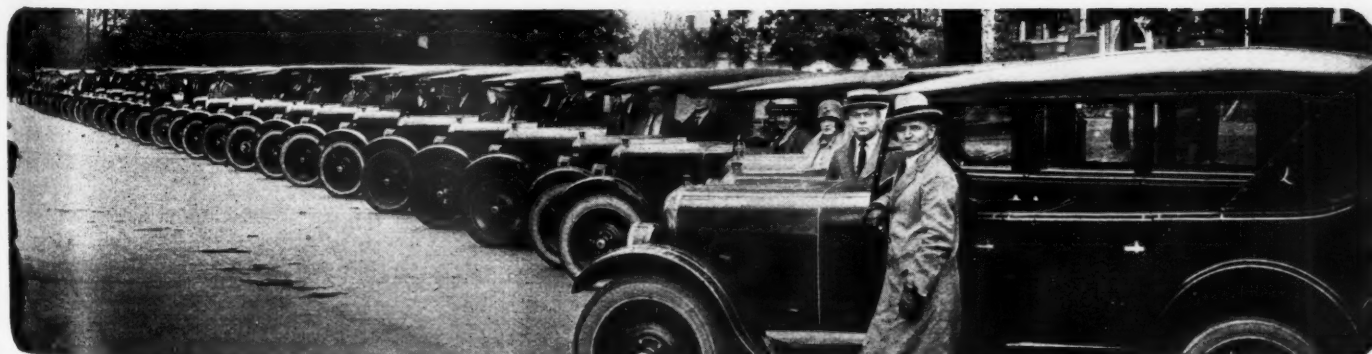
# OF AUTOMOTIVE INTEREST

Here we have the Singer midgets all ready for a fishing trip which would not be complete without an automobile



This unique float won first prize in an advertising contest held at Durban, South Africa. It was built by the Studebaker distributors at Johannesburg and is a replica of the poster slogan "This is a Studebaker Year," sent all over the world in 1922

George F. Betz, with his acreage counter for use in gathering statistics on crops. The operator as he drives along pushes a button at the beginning of a field of grain and the apparatus measures the number of feet travelled. The name of the crop is over each button. The device will be used by the U. S. Department of Agriculture



Quite some collection of Oaklands driven from the factory to the Indianapolis branch. The Hoosiers demand plenty of motor cars for use on their good roads



# The READERS' CLEARING HOUSE

## Questions & Answers on Dealers' Problems

### Zenith Says We Guessed Right

On page 27 of the Aug. 21, 1924, issue of MOTOR AGE, the Colorado Subscriber wanted to know the jet sizes to use with Zenith carbureter and a certain Continental engine at an altitude of 10,000 feet. The question in addition to being answered direct was referred to the Zenith Detroit Corp., and they wrote the Colorado Subscriber as follows:

"Mr. A. H. Packer of Motor Age has sent us the question and answer regarding the Model L4 Zenith carbureter on a Continental model N engine, 3 $\frac{1}{4}$ x5, used at an altitude of 10,000 feet. In studying the answer given by Motor AGE, we find that they have given you exactly the right information, and we are sending you today by parcel post insured the necessary jets to make these changes.

You cannot expect to get any percentage of increase in power by changing the carbureter setting, but you can, however, be certain that you will be able to show more economical running. The power of a gasoline engine depends on the weight and the volume of mixture taken into the cylinders. Naturally your air is considerably lighter in weight at 10,000 feet than it is at sea level and the relative power will be proportionate to the relative weight of air.

However, on account of the lighter weight of the air you do not require the same amount of fuel that is necessary at sea level. You can drive all right with the same amount because there is quite a wide range of mixture strength in which there is very little difference in power development. Therefore, by using smaller jets you will be cutting down the amount of fuel you use without sacrificing in power. In addition, you will have a cleaner running engine and one which we believe will give more satisfaction.

To get an increase in power, it would be necessary for you to increase the compression of your motor and this could probably best be done by fitting pistons slightly longer than the standard pistons in the motor. If you would be interested in this, we will be glad to work out the necessary information to tell you just how much you should add to the pistons to give you maximum power results at 10,000 ft. altitude.

Very truly yours,

ZENITH-DETROIT CORP.,

By Assistant General Manager."

Co-operation of this sort is very much appreciated by MOTOR AGE and its subscribers.

### PRESSURE LUBRICATION SYSTEM THAT DID THE TRICK

Q. I was supposed to let you know how your test proved out. Your idea was the same as mine and I tried the oil test on the 7-R Continental. I made up an oil tank as per your suggestion for the purpose of testing and connected it to the pressure lubrication system in place of the pump which normally sent oil through the crankshaft. To my surprise no oil at all came through, and this test was made by dropping the lower engine pan and watching the connecting rod bearings while air pressure was applied to the oil test tank

### The Readers' Clearing House

**THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.**

**All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.**

**Readers' names will not be published with articles, if a request to this effect is received with the letter.**

**Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.**

**Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.**

**Addresses of business firms will not be published in this department but will be supplied by letter.**

**Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.**

to force oil through the system. The crankshaft was apparently completely stopped up and we found that this was due to the fact that the owner of the car had been using a mixture of cylinder oil and a heavy lubricant about the consistency of vaseline and this accounted for the oil passages in the crankshaft being stopped up. The motor is now O. K. and works with oil at the proper level. The other garage men around here could only make it work by filling the crankcase so full of oil that the connecting rods would dip in the oil. I must compliment you on the test for the oiling system and wish to say I am saving the tank for future reference. If you will send us your bill we will pay it at once, for the assistance was very valuable on this job. John W. Harris, Mt. Pleasant, Ohio.

There is no charge for the assistance rendered in this way to readers of MOTOR AGE and we are very glad to find that the test worked so well.

### BIG ENOUGH NOW

Q.—We would like to install larger valves in an Oldsmobile eight-cylinder car, model 45-A. Could a valve with a one and one-half inch diameter head be used?—Harry Brennan, Marshalltown, Ia.

A.—There is just barely clearance for the present valves so that it is impossible to install larger ones.

### To Make a Chevrolet Ramble

Q.—I am planning to build a speedster next spring and would like to have your opinion on the following: The motor is a Chevrolet with Dodge valves. The crankshaft is counterbalanced and cylinders reground so that Ford size Dow-Metal pistons may be installed. The reason for this is that the Ford piston is a dome head piston and will raise the compression of the Chevrolet engine. The chassis is an underslung Ford chassis with frame trussed to strengthen it. A Chevrolet rear axle and driveshaft will be used while the front axle will be Ford with a worm steering gear. Do you think it will be a good car and will it do 65 m.p.h. with a standard gear ratio? What is the maximum r.p.m. and maximum brake hp. of a Chevrolet motor?—Geo. R. Clark, Nashville, Tenn.

A.—The regular Chevrolet motor should turn up to 2400 r.p.m. and should develop 25 hp. at 1800 r.p.m. At higher speed, however, the horsepower drops off. The general nature of the changes you are making is good. It might be well, however, to use the larger valves for the intake only, using the standard valve for the exhaust. It is also desirable to use a larger carbureter and intake manifold and when this is done the exhaust passages should be enlarged by grinding. For racing purposes a special camshaft is desirable, so as to give longer opening for the intake valves. Higher compression is desirable and you mention using a piston which will give this. The compression should be high enough to produce a bad knock when ordinary fuel is used. You can then resort to Ethyl gasoline or benzol or a mixture of benzol and gasoline to get good operation from the engine. While we cannot say definitely we believe that you should obtain the speed you mentioned with the changes enumerated.

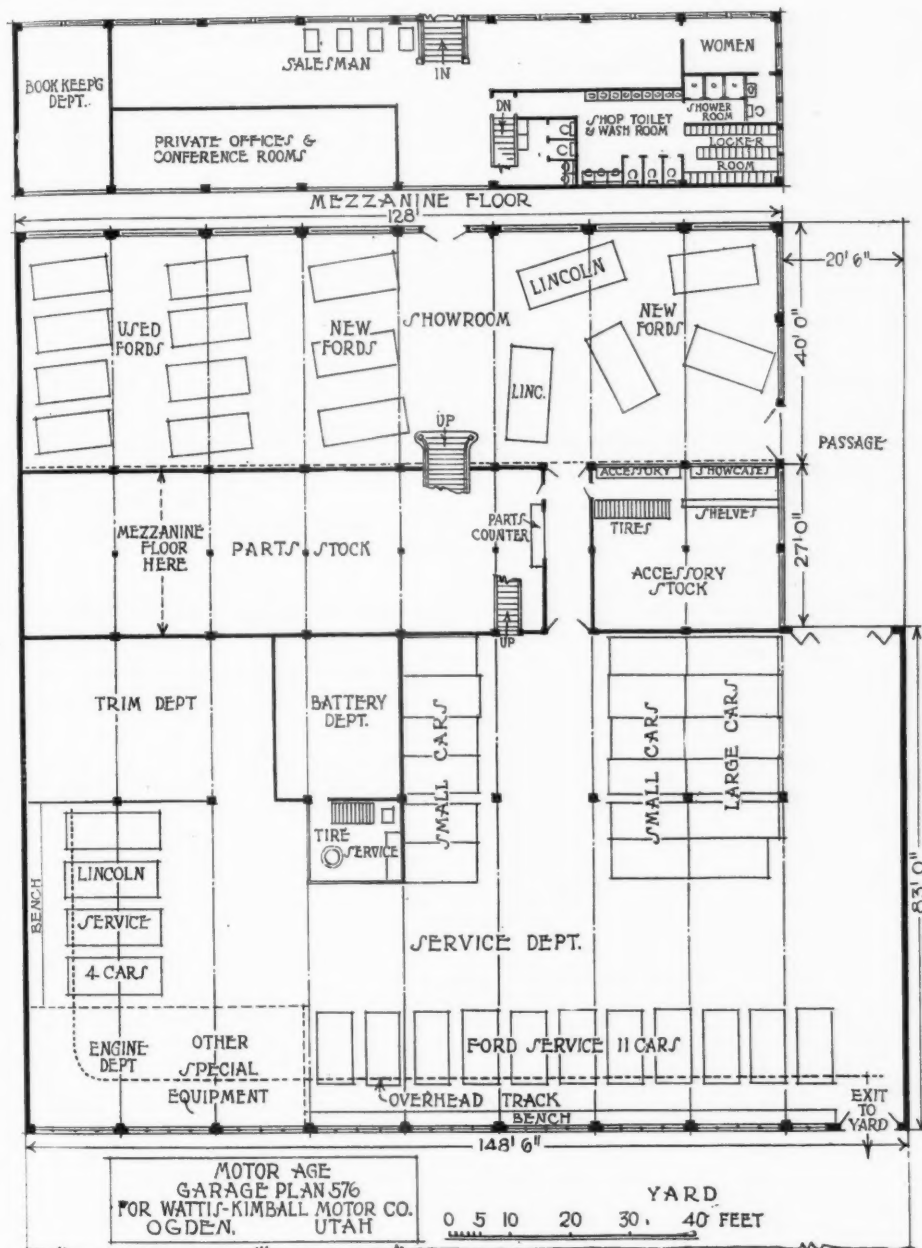
### A PRETTY THIN EXPLANATION

Q.—We have a Lincoln car in our care which knocks as if it is full of carbon but I know that that is not the case, as the car is new. It seems as though you can hear it going up a slight hill and sometimes you can hear it when accelerating the motor, dodging in and around traffic. Can you give a solution for this difficulty?—George W. Mauch, Benton Harbor, Mich.

A.—We are indebted to the service manager of one of the Ford-Lincoln Service Stations here in Chicago for the answer to this problem. The knock is due to a thin wall in the exhaust manifold on either the right or left hand cylinder block. This is caused by the core used in casting the manifold being a little off center so as to produce a thin wall at one place. At certain engine speeds this thin place in the casting will vibrate and make a sound like a bell.



## Ford-Lincoln Sales and Service Building



Q. We are enclosing a rough sketch showing ground floor plan of Ford sales and service building we are contemplating building. We have shown size of showroom, stockroom and repair shop as we thought they would be efficient for our purposes and we would appreciate if you would make any suggestions you consider desirable.

There will be no garage. We will probably want room in the showroom for at least two Lincolns on the floor, five or six new Fords and a few used Fords in one end. In the shop we want a large repair shop for Fords, including a battery and motor service department, and one corner for service for Lincolns only. We employ

about 15 men in the shop on the average. In the stockroom we carry an average stock of \$30,000 Ford parts, tires and accessories.—Wattis-Kimball Motor Co., Ogden, Utah.

A. We have made our layout virtually like your pencil sketch except we have narrowed up the passage slightly though it is still wider than the average state highway. Our principal reason for narrowing it was to get an even spacing of the roof trusses, 16 ft. on centers with not too great a span between the last truss and the outside wall on the side of

the passage. We have also carried the driveway further back, as this space is more valuable open to the light and permitting the light to enter the accessory department and mezzanine floor than as a closed passage with no special use.

Believing that a mezzanine floor of the size you indicate will be much larger than necessary for office use, we have taken part of it for a women's waiting room and for shop toilet, locker room, etc., this latter part, however, being separated from the rest and reached by a special stairway from the service department. The stairway will also be handy for communication between the office and service department.

Although you have stated that you do not want any garage, it is always necessary to have space for cars awaiting repairs and those waiting their owners which in a shop of this size is quite a number, and it is always better to have a definite place for them. We have arranged for three short rows, two of small cars, 12 in number, and one row of large cars. This space could hardly be called a garage. If there is a service truck this could occupy one of the large spaces, or it could be kept in the yard behind the building.

Long trusses span the back part of the shop and the showroom spaces and shorter ones of equal length support the roof over the mezzanine floor and the space just to the rear of it. The trusses over the showrooms and over the mezzanine floor are of even height while those at the rear, over the shop portion may be lower, 11 or 12 ft. from the floor.

### VALVES THAT BIND

Q.—We are experiencing considerable trouble with the valves of a model V-61 Cadillac. We are obliged to clean carbon every 800 miles, owing to a valve sticking and the engine missing, and find that after the carbon is cleaned, we have trouble with the valves squeaking. We wrote the Cadillac factory and were advised to shoot oil into the valves occasionally but this does not eliminate the trouble. The valves have been ground and are not warped. The compression is good and the ignition and carburetor are O. K.—John Monroe, Allentown, Pa.

A.—It seems likely that either a valve stem is bent or one of the valve springs is weak. We accordingly recommend that the next time you grind the valves, you would check the stems with a straight edge and smooth them up with emery cloth. It might also be advisable if the springs appear weak to install a new set. If carbon accumulation around the valve stems is responsible for the trouble experienced, you may be able to get relief by squirting kerosene on the valve stems while the engine is running.

### Architectural Service

IN giving architectural advice, MOTOR AGE aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things, we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected to be.

Number of cars on sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

How much of an accessory department is anticipated.



## From a New Zealand Race Fan

Q. Will you please mail me the following information:

What is the name of Sig Hougall's racer and what is its maximum speed?—R. Yankovick, 1 Ligor place, Grafton, Auckland, New Zealand.

A. The Wisconsin special which was the special racer driven by Hougall is unofficially credited with a maximum straight-away speed of 181 m. p. h. This high maximum speed was made in breaking the record for 1 kilometer. The record was not verified by the A. A. A., and, therefore, is not considered an official record, either in the United States or for world's record.

Q. Is Murphy the World's champion driver?

A. We do not know of any classification or organization that has determined who is the world's champion race driver. The American Automobile Association contest board designates the champion for the year among the drivers competing in American races. The A. A. A. champion for last year was Eddie Hearne.

Q. What does he drive and what is his highest speed?

A. At the present time James Murphy is driving Miller special cars. Murphy has made well over 120 m. p. h. at Sheephead Bay while employed by the Duesenberg brothers. He held the world's record for 250 miles up until the time it was broken by Harlan Fengler.

Q. What are the world's fastest cars? State five or six and their speed in their respective order.

A. The official world's record for distances from one to ten miles are held by the four cylinder Benz car and were made as far back as 1909 and 1914. The original Benz record which was officially 124.11 m. p. h. has been unofficially broken by the Packard twin-six aviation motored car driven by De Palma, by Tom Milton with the 16 cylinder Duesenberg, by Sig Hougall with the Wisconsin Special and by E. A. Eldridge with the Fiat six cylinder aviation engined car. The Duesenberg 16 cylinder job holds the A. A. A. records for 1 to 10 miles.

Q. What is the average speed per hour for the Sunbeam for its "Grand Prix" win of 500 miles?

A. Approximately 78 m. p. h.

Q. Is the Rolls Royce a car for speed?

A. The Rolls Royce is not designed primarily for speed but for quietness and reliability, according to the manufacturers.

Q. Has it ever taken part in any big race?

A. Of late years no.

Q. What is the fastest car—a Twin Six or a V-4, or straight eight?

A. We cannot answer this question definitely. The 16 cylinder Duesenberg was nothing more or less than two complete eight cylinder engines driving through two driveshafts to the rear axle. The Benz was a four-cylinder engine, the Packard a twin-six and the 183 in. car used by Milton on the dry mud bed in California recently was a straight-eight. The latter car showed better than 150 m. p. h.

Q. Can the Duesenberg and Miller race the Packard?

A. We don't know what you mean and are unable to give you an accurate an-

swer. According to literature put out by the Packard company their straight-eight model is capable of 70 m. p. h., whereas the Duesenberg stock model will do 75 m. p. h. and no figures are available on the Miller stock car although the 183 inch race cars are good for 150 miles per hour.

Q. Will you especially tell me where the Packard comes amongst the fastest cars in the world, as I always thought the Packard was the fastest car in the world? I have specifications of Duesenberg, Packard and Studebaker from Motor Age specification tables. What are the specifications of the Miller, of the Studebaker that came in second in the Indianapolis race? Say only number of cylinders, bore, stroke, gear ratio, make of carburetor and how many of them as a racer?

A. The specifications that you desire regarding Studebaker Special that raced in Indianapolis and the other cars that campaigned in the same contest were printed in the June 5 issue of Motor Age.

Q. In a Duesenberg ordinary car the number of cylinders is eight, the bore is 2 1/2, stroke five and gear ratio 4.9. In the racing Duesenberg it had eight cylinders, bore 2 3/4, stroke 3 27/64 and gear ratio 3.75. Do these later specifications make it speedier? Would not this car go faster if the former lot of specifications were left instead of the latter? I thought the bigger the bore, stroke and gear ratio, the faster the car.

A. All the speedway racing that has been run off in 1923 and 1924 under the auspices of the A. A. A. had limited the cars to 122 cu. in. which accounts for the small engine and higher rear axle ratio.

### REBUILDS ESSEX FOR SPEED TRUCK

Q.—We are rebuilding an Essex 1924 four-cylinder car and would like to have a wiring diagram. Would also like to know if the condenser is in the breaker box or in the coil? The body was burnt off of this car and we wonder if it will make a good speed truck? About what load will it carry on good roads?—R. W. Taylor & Son, Marionville, Mo.

A.—The wiring diagram is shown in accordance with your request. The condenser is a unit with the interrupter and is not in the coil. As this car was designed for passenger service, we do not believe it would be capable of handling a very heavy load. We would estimate, however, that from 1,000 to 1,500 pounds

would be a safe load to carry. The rear axle and rear springs would stand the brunt of this burden and it might be necessary to install extra leaves in the springs.

### KEEP VALVE COMPOUND OUT OF THE BEARINGS

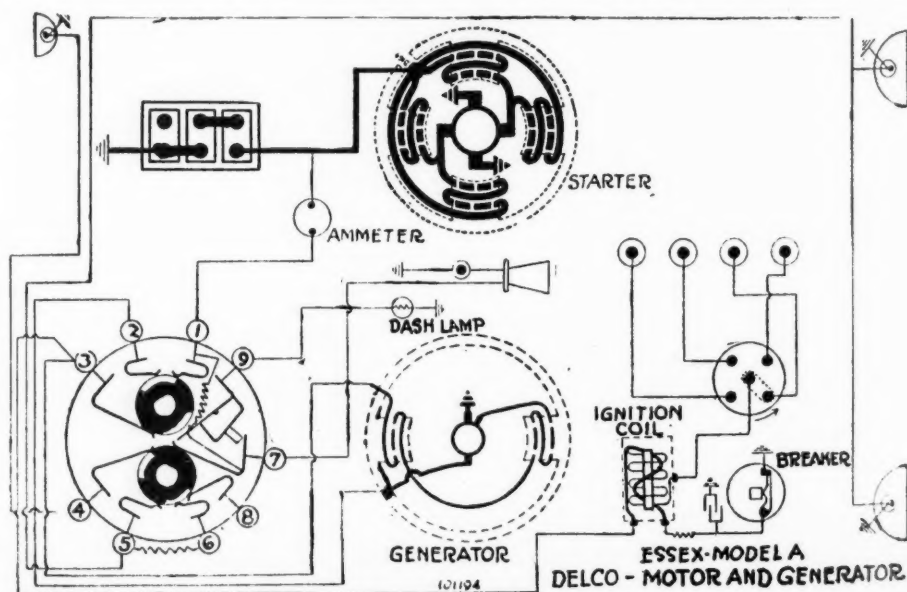
Q.—Would you recommend using valve grinding compound for fitting bearings on a crankshaft of an automobile motor? Can a rough crank be smoothed up in this way without hurting the bearing?—Hawkeye Subscriber.

A.—Valve grinding compound should never be used on bearings for it becomes imbedded in the babbitt and continues to wear the bearing surfaces so that bearings rapidly loosen up after being fitted in this way. It would also be out of the question to properly true up a crank pin in this way. The best method is to have the crankshaft reground at a shop specialized in this work. It is also possible to use one of the crank pin truing tools made by some of the larger equipment makers. After a bearing has been fitted to a good crank pin, it is best to use a special compound which is made for the purpose of getting a 100 per cent bearing surface. Large automobile jobbing houses can supply the right compound which is made of a crystalline substance which soon loses its abrasive character so that even though some remains in the engine, no harm results.

### REGARDING 1916 CHALMERS BEARINGS

Q.—Would like information in regard to taking up main bearings on a 1916 Chalmers model 32-B. Have had bottom off of crankcase and can see no way to take up bearings. The center bearing has a cap but the end bearings seem to be of the sleeve type.—Knox Co., Newcomers-town, Ohio.

A.—We are advised by the local Chalmers Service Station that the bearings are of the conventional type, caps being used on the front and rear as well as the center main bearing. If you are unable to handle this work, would suggest your getting in touch with the nearest authorized Chalmers Service Station.





## "Cease Firing," Says Ignition

Q. We have a late model Buick four which has been driven 2600 miles and when it is operated five or six miles at a speed of 35 miles per hour or more and the ignition is then cut off, the engine keeps on running for five or six revolutions and then stops. We have ground the valves and left clearance of .010 in. when engine was hot. We have tried shorter spark plugs as the long plugs looked as though the points were getting red hot, and we felt that this would keep the gas firing after the switch was cut off. We even tried to stop the engine firing by installing an extra cylinder head gasket on the car, but this did not do any good. The owner of the car advises that he did not have any of this trouble until he had the valves ground at another garage. We also checked for air leaks at intake manifold and tested for leaks with gasoline, but all joints seem to be tight.

A condition of this sort is due to overheating which may be caused by the spark being too much retarded, by carbureter being set to give too lean a mixture or by carbon deposits in the engine. The ignition should be set with advance lever in the retard position so that the interrupter points just begin to open when flywheel is 7 degrees past top dead center. Seven degrees is the equivalent of about one inch on the flywheel. If the ignition is not properly timed the setting may be changed by removing the knurled cover at the base of the distributor and then loosening the hex-head screw. The distributor rotor and cam may be then turned to any desired position and the screw tightened again. If the carbureter setting is suspected, it might be well to try turning the gasoline adjustment slightly to the left and the air adjustment screw slightly to the right. On the dash there is an adjustment used in starting and when the engine is hot this adjustment is normally turned to the cold position. It might be well to try the operation of the engine with this adjustment turned back somewhat from the cold position.

Q. When this car runs down small slopes the rear end seems to buck as if the motor was skipping. What do you suppose is the reason for this condition?—South Carolina Subscriber.

The action of the springs on the Buick four is such that in a measure they act as rebound checks. If these springs are lubricated to any great extent the rebound check action is eliminated and the springs become altogether too resilient. This may account for the condition you describe.

## KENTUCKY ALLOWS LIEN

Q. We are seeking information in regards to a mechanics lien and a mortgage. We have a Ford in our place of business and are holding same for the work that we did on same, this car is mortgaged for all that it is worth. We want to know if we have the right to hold same for that work we have done. The mortgage is properly recorded. We contend that we have the right to hold same, regardless of the mortgage and if the owner does not pay the bill in a reasonable length of time we can advertise and sell the car for our debt. Let us know about this. Wilson Garage Company, Bardstown, Ky.

A. The Kentucky statute, section No. 2739h-1, gives the garage keeper a lien for all repairs made and accessories or supplies furnished automobiles brought to them for that purpose. Any car upon which service has been rendered may be detained until charges are paid, or such car may be returned to the owner and the lien remains good providing the garagekeeper shall assert such lien within six months of filing in the office of the county clerk a statement covering the charges. This statement is filed in the same manner as the lien of mechanics and material men is asserted against real property.

Now the apparent intention of the statute is to give the lien priority to a prior recorded chattel mortgage as in the case you suggest. However, I do not find that the point has been decided in Kentucky. For instance, Illinois has declared as unconstitutional and void a statute which sought to give garagekeeper a priority to his lien over a prior recorded lien. But some other states have such statutes and still others have given priority to the lien of the repairman through a legal inference that the mortgage holder authorizes the owner to make the repairs by permitting the owner or mortgagee to retain possession of the machine and to use same.

Finally unless the court would so construe the implied authority of the owner of the car, or read the legislative intent of the act to grant the repairman a priority in his lien, a supreme court would give its decision on the grounds of a priority in time of creating the lien gives its prior rights.

However, in my opinion you have the points in your favor in a contest in the court.

## FRONTY FORD BEARINGS

Q.—Did not the Fronty Fords at the Indianapolis race have ball bearings in the rear axle both at the wheel end and as thrust bearings replacing the babbitt washers, and if so, what kind of bearings were used and what methods were used to install them?

A.—The Fronty Fords used in the Indianapolis race did have ball bearings at the points you mention, that is, at the wheels, at the thrust bearings and in addition the roller bearings at the differential were replaced with ball bearings. In stock Fronty Fords, however, the roller bearings at the differential are not changed to ball bearings and the babbitt washers are replaced with the ball thrust bearings. Additional information can be obtained from the makers of these cars, Chevrolet Bros., Indianapolis.

Q.—We are under the impression that these Fronty Fords used 28x4 tires and if so, would like to know what company makes this size, and what make of wheels were used and where they can be obtained?—Clifford W. John, Sterling, Ill.

A.—The wheels were made by the Dayton Wire Wheel Co., Dayton, Ohio, while the tires are made by many of the tire companies and are standard straight side tires.

## No Two Alike, Says He

Q.—Advise me why some Ford engines pull better than others even though we use the same precautions on all of them.

A.—There are so many factors affecting the operation of engines that our human ability is probably insufficient to check them perfectly. For example, the operation of an engine will depend on the ignition timing, the carbureter setting, the compression, degree of friction in the engine, axle and other parts, and on the valve settings. From this it can be seen that a variation in several of these factors would make a difference in the way an engine would run.

Q.—What is the proper valve clearance for Fords?

A.—From .015 in. to .025 in.

Q.—What causes a piston knock in a Buick "6" even after pistons have been properly fitted?

A.—Perhaps you have the pistons turned the wrong way, for it makes a difference in the Buick engine where the wrist pin is located off center. In Buick engines, the thick side of the piston should be to the left when viewed from the rear. The arrow cast in the piston should point toward the camshaft which is on the right side of the engine and the cotter pin should be toward the front of the engine. The clamp bolts on the connecting rods should be on the side of the piston pin away from the camshaft.

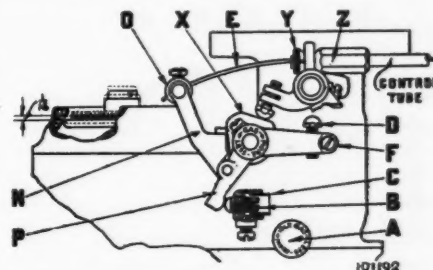
Q.—Can a spark knock in a Superior Chevrolet be removed permanently?—Pennsylvania Subscriber.

A.—A true spark knock is produced by having the ignition too much advanced. It may be corrected by retarding the ignition timing. A similar knock is produced with proper spark timing when carbon accumulates in the engine. Rapid accumulation of carbon is usually caused by poorly fitted pistons and piston rings.

## ADJUSTING THE MODEL S SCHEBLER CARBURETER

Q. We have been working on a Ford coupe equipped with a Rajo cylinder head and a Schebler Model-S 1 1/4 inch carbureter. The car does not seem to accelerate well and the trouble seems to be in the carbureter. Can you send us an illustration, also instructions for adjusting, and if possible, suggest other possible causes of our trouble?—Fox Garage, Cedar Rapids, Iowa.

A. The illustration of the carbureter is shown in accordance with your request, the adjustments being as follows:



**Idle Adjustment:** Turning the idle adjusting screw (A) to the right (clockwise) gives a lean mixture. Turning it to the left (counter clockwise) gives a richened mixture. This adjustment is



not sensitive. Several notches either way will not affect the idle very much.

The idle adjustment should be set so that by depressing the air valve slightly (about 1-32 of an inch) the engine will start to cut out, showing that the idling mixture is about right. If the mixture is too lean the engine will stop when the air valve is depressed slightly. If the mixture is too rich the engine will speed up slightly on depressing the air valve and the air valve will have to be depressed considerably before the engine cuts out.

**Important:** If the idle adjustment is turned to the right (clockwise) too far, the air valve will not seat, since the needle is shut off too far. Turn to the left or (counter clockwise) until air valve seats and adjust as explained above.

**Range Adjustment:** This adjustment is only effective in the driving range at speed from 20 to 40 miles an hour and does not affect acceleration or hill climbing. This adjustment as shipped from the factory will usually be found to be the best unless it is necessary to give a lean or richened mixture at speeds from 20 to 40 miles an hour. Turning the range adjusting screw (B) to the left (counter clockwise) gives the driving range a lean mixture. Turning it to the right (clockwise) so that more of the threads of the screw (B) are exposed gives the driving range a richened mixture. To obtain the original setting as shipped from the factory, set the end of the range adjustment screw (B) flush with the range adjustment bushing (C). This is the winter adjustment. If the range adjustment is changed it is necessary to readjust the idle mixture.

**High Speed Adjustment:** This adjustment as shipped from the factory ordinarily need not be changed. This adjustment is not sensitive to one turn in either direction and is only effective for the wide open throttle running. In changing this adjustment try it on a hill after each change for best results. In extreme cases it may be necessary to furnish a leaner or richer mixture for wide open throttle position. The adjusting cam tappet screw (D) is turned to the left (counter clockwise) to give a richened mixture and turned to the right (clockwise) to give a leaner mixture.

With throttle wide open adjust the cam tappet screw (D) until there is about  $\frac{1}{4}$  to 5-32 of an inch space between the dash control lever (P) and the end of the range screw (B).

It might also be well to write to the Rajo Motor Company, Racine, Wis., giving them the model number of the cylinder head as found near the manifold, and ask for their recommendation on valve clearance.

#### NATIONAL QUESTIONS

Q.—What is the rear axle gear ratio of the 1922 National Sextet BB series roadster?

A.—4.08.

Q.—What is the best speed that can be expected from this car in its stock condition?

A.—Sixty-five to seventy miles per hour.

Q.—To what extent would you estimate the speed to be increased by changes and what changes would you suggest?

A.—The fundamental requirements for high speed operation include balanced parts, light weight reciprocating parts, very high compression, large carburetor and inlet manifold and inlet ports, and reduced friction in all moving parts. The exact changes to make should best be recommended by someone familiar with rebuilding automobile engines for racing purposes.

Q.—When a Westinghouse generator on this car will under no circumstances show more than 10 amperes charging rate when on the block test why does the rate jump to 15 and 18 when mounted on the car?

A.—This generator has third brush regulation which is somewhat sensitive to battery voltage. Such a generator will charge a well-charged battery at a higher rate than it charges a badly discharged battery, so that without comparing the voltages of the circuit you can make no very accurate comparison.

Q.—Did National or Winton build the first six-cylinder job in the U. S.?

A.—We understand that the honors are in question between Winton and Stevens-Duryea.

Q.—Are the bearings in the National BB lined reamed or not?

A.—Yes.

Q.—What is the best speed to be expected from the stock Wills Ste. Claire of current model?

A.—Seventy to seventy-five miles per hour.

Q.—What is the size of the crankshaft in the National BB and what other cars have shafts of the same size or greater?

A.—Main bearings in the National model BB have diameter of 2.5 in. In the Leach car the main bearing diameter is 2.68 while in the Marmon it is 2.75. Locomobile and Stearns-Knight have diameters the same as in the National, that is, 2.5 in.

Q.—What is the make of motor used in the new Jordan Eight?

A.—Continental.

Q.—What make is the motor in the Flint?—James A. Ewing, Youngstown, O.

A.—Continental.

#### OILY BRUSHES AND POOR SOLDERING

Q.—I note in your issue of July 31st a letter from a reader thanking you for information on how to correct the glazing of armature on a Ford generator. We are having same trouble with a Ford and a Chevrolet, and would appreciate knowing the remedy.

A.—We assume that the previous question referred to excessive oil getting on the commutator. This is caused by putting too much oil in the oiler. The oil soaks into the brushes and forms an insulating film between the brush and commutator. The remedy is to install new brushes, sand paper the commutator and use not more than one or two drops of oil at very rare intervals. From an operating standpoint, it is perhaps better

to take a chance on lack of lubrication on this bearing than to over-oil and cause the generator to stop charging.

Q.—On several Chevrolet starting motors we are having trouble when the armature stops with brushes at a certain position. Under these circumstances, the starter is dead. Move it slightly, however, and the starter works alright.—W. R. Moore Garage, Benjamin, Tex.

A.—If the lights go nearly out under these circumstances, you have a bad ground of intermittent character in the starter. It is more likely, however, that one or two bars of the armature have leads poorly soldered, and we would suggest your resoldering all the leads in the commutator.

#### Cleaning Sediment From a Radiator

Q.—We have a 1921 model 6-44 Paige that overheats after driving about three miles. When racing the motor idle, it makes the lower hose connection collapse, which makes us think that the radiator is stopped up. We removed the lower hose and put a wire coil in it which overcame the hose trouble but the engine still overheats. Last year we could drive 40 miles per hour without trouble due to overheating.

A.—It might be best to take this radiator to some good radiator shop as they will have solutions for this purpose. In many cases, however, deposits in radiators do not seem to be soluble in any known solution and often a new radiator core is required. Soda and lye are sometimes effectual in removing oil and dirt, such a solution being used in the cooling system and heated to the boiling point by running the engine. Draining and washing out with a stream of clear water is then recommended. Where lime has been deposited, muriatic acid is sometimes effectually used, the solution being made of equal parts of water and acid. In using acid, great care must be exercised to see that the acid does not get on finished parts of the car.

Q.—Give valve timing of this Paige engine.—Henry L. Austghe, 51 Douglas street, Hammond, Ind.

A.—The exact time is not available, but we believe you will have it about right if the exhaust valve closes when the piston has come up to its top position and has started down again, being not more than  $\frac{1}{64}$ th or  $\frac{1}{32}$ nd in. down.

#### WHY CHECK THE ROD BEARINGS AND PASS UP THE PISTON PINS?

Q.—I have a Federal  $1\frac{1}{2}$ -ton truck, Model T. E. 1921, that has an annoying knock. This condition has continued for the last eight or nine months, the noise being most noticeable at idling speeds and at a hard pull. The main bearings and connecting rod bearings have been taken up twice by the local service station, and still the knock continues. Could this be due to timing gears? There is some play in the pump shaft when rotated.—Carl H. Roden, 614 Myrtle street, Scranton, Pa.

A.—You do not mention checking up the piston pins for looseness and this seems to us as the most likely cause of the condition you describe. You might also refer to our list of "Thirty-Four Causes of Engine Knocks."



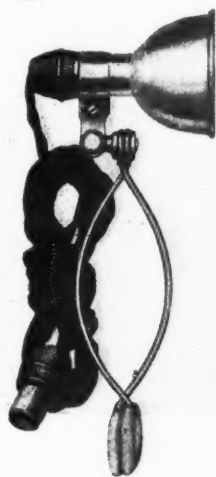
# BOOSTING ACCESSORY SALES

**H**AS it ever occurred to you, Mr. Transportation Merchant, that a well stocked accessory store is just as important in a commercial way as any other kind of store? It is very annoying to the customer to go into any store and find a limited field for his selection. He likes to have a wide variety from which to choose in order that he may turn over in his mind the merits and demerits of the respective articles which are presented for his consideration. If he finds that the field for his choice is narrowed through improper stocking on the part of the merchant it creates a bad impression, and in the future he is apt to turn his attention elsewhere.

When a car owner goes into a transportation store it pleases him if he finds the accessory which will meet a long-felt need. On the other hand if he is unable to find what he is looking for, that particular transportation store is not likely to linger long in his mind. That's why it pays to study the new accessories that make their appearance from time to time with a view to deciding just what articles you ought to stock in order most efficiently to serve your customers.

## Klasp-Tite Extension Light

This embraces a highly polished aluminum reflector designed for the automobile and all other battery and low voltage circuits. It is equipped with a spring grip to permit its being attached to any part of the car and the adjustable head makes it possible to direct the light exactly where it is wanted. The price complete with 10-ft. cord, single or double contact, is \$1.75. It is made by A. B. Stewart & Co., 225 W. Huron street, Chicago.



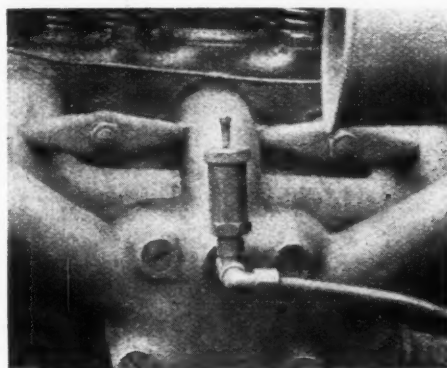
*Klasp-Tite extension light*

## The Vacu Gas Governor

The Vacu Gas Governor is a device used for the purpose of admitting air to the intake manifold at certain speeds, where on many cars the conventional adjustment of the carburetor gives too rich a mixture. The valve in this device stays closed while the motor is idling, when pulling hard up-grade and when the ac-

celerator is quickly opened for pick-up in traffic or on a hill. The Vacu is open, however, and stays open while the motor is pulling easily, with moderate load and at practically all speeds between 15 and 40 miles per hour.

The device lists at \$5, the maker being the Vacu Manufacturing Co., 22 Quincy street, Chicago, Ill.



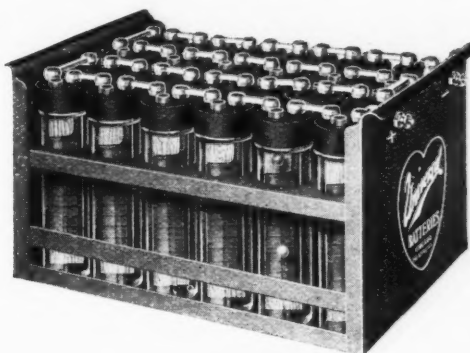
*Vacu Gas governor*

## Universal Radio "B" Battery

For the use of radio enthusiasts the Universay Battery Co., 3410 S. LaSalle street, Chicago, has put on the market a "B" storage battery, made in two sizes— $8 \times 5 \frac{1}{2} \times 6 \frac{1}{2}$  in., and  $11 \frac{1}{2} \times 7 \times 6 \frac{1}{2}$  in. The glass jars are sealed with molded hard rubber covers; vent openings are large enough to insert a hydrometer and are fitted with hard rubber plugs.

A feature of the battery is the indicator balls which tell when and how long to charge. There are two balls—red and white. The gravity of the red ball is 1.150 and of the white 1.250, which are the maximum charge and discharge points. When the red ball sinks it is time to charge the battery; when the white ball floats, stop the charge.

The plates are  $\frac{7}{32}$  in. thick with a capacity of  $3 \frac{1}{2}$  ampere hours. There is one  $\frac{1}{8}$ -in. separator in each cell to prevent short circuits and keep the



*Universal radio "B" battery*

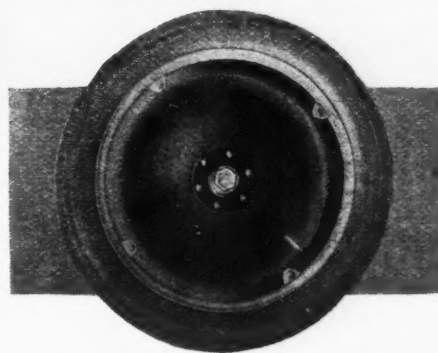
plates from touching. The connectors are strong, accessible and so designed that clips get a good grip when used for tapping off less than the full voltage. There is a lead terminal at each end

for supplying current to the amplifier tubes. This battery is made in 2, 24 and 48-volt units. The 2-volt unit is used as a "C" battery; the 24-volt is for use on detector tubes, is provided with end terminals and has side terminals for tapping off 18, 20 or 22 volts.

## TruSteel Disk Wheels for Small Cars

Owners of Fords, Chevrolets and Overlands who like disk wheels for their cars will be interested in the announcement of the TruSteel Wheel Co., Empire Bldg., Detroit, which ships sets of four wheels in dust-proof cartons. The price complete, including rim bolts and nuts, also hub bolts and nuts for assembly, is \$30, f. o. b. Detroit.

In making the transfer the rims, either

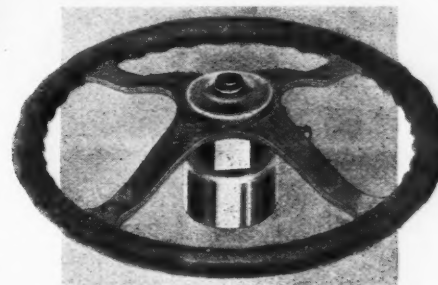


*TruSteel disk wheels for small cars*

clinchers or straight side, are used just the same as on the wooden wheels, the disk wheels demounting at the rim. They take the hub from the wooden wheels and hub flanges are held securely by a specially designed hub-locking device. The wheels are finished in baked-on-black enamel and all lugs and bolts are galvanized.

## All-Wood Steering Wheel for Fords

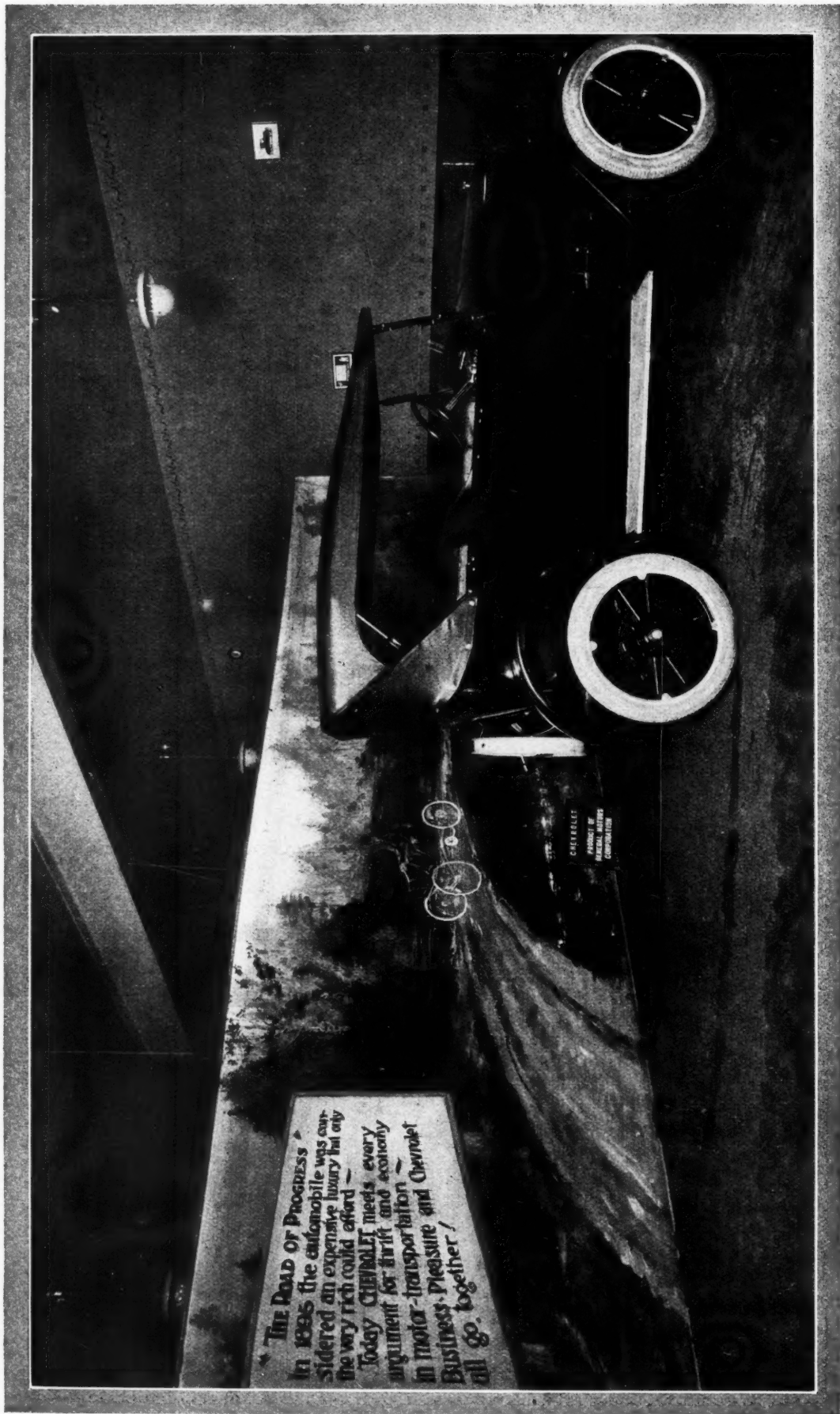
Ford owners will be interested in all-wood steering wheels such as are designed for higher priced cars. Sewell Cushion Wheel Co. of Detroit is offering such a wheel with lock, the list price of which is \$16.50; without the lock the price is \$10. The wheel is made of genuine walnut, with dark walnut finish. The one-piece wood spider is made of laminated wood imbedded in the rim to secure greater strength. The wheel is equipped with horn button on top.



*All-wood steering wheel for Fords*



## A Bit of History in the Background Adds Interest



**T**HIS window display by the May Chevrolet Co., of Alexandria, Ind., has a suggestion for effective treatment that might well be used by other dealers. The painting which forms the background has an historical touch that seldom fails to cause people to stop and look. The sign board tells the story of the road to progress, hooking it up with the modern vehicle on display.



# EDITORIAL

## Profit Opportunities

THE spare tire that ought to be on every automobile should be securely locked to prevent theft. A survey covering more than 5,000 cars equipped with spare tires, in several cities, showed that less than half had locks. In other words, among the 5,000 cars noted in this survey there existed more than 2,500 opportunities for live dealers to sell locks to protect the investment of car owners in spare tires. If the same percentage should hold good throughout the country it would reveal an enormous market for a single accessory running into millions of dollars.

But that is not the end of the opportunity. A great many cars are running without a spare tire. Every such car so operated is another opportunity for the sale of both a tire and a lock.

Do not get the idea that all the accessories have been sold. The automotive world is full of profit opportunities for the energetic dealers who are willing to give salesmanship a chance.

## Stocks That Are Reasonable and Economical

THE overstocking of dealers and distributors by manufacturers has long been a cause for complaint in the automotive industry. The retail distribution agencies often have been required to take cars greatly in excess of their immediate sales possibilities. The result in many cases has been disastrous. But on the other hand there have been times when dealers complained just as bitterly because they could not get cars for delivery when the demand was greatest.

It has been the ambition of manufacturers to level off the volume of production and effect economies by manufacturing at a more or less constant rate throughout the year. But dealers have not found it possible to level off the sales volume in a corresponding degree which would be necessary to the smooth operation of the plan.

Now comes General Motors Corporation with the flat statement that hereafter the production of its various units will follow very closely the sales trend. An effort will be made to spread production out over the year in the most economical manner and dealers will be expected to assume a just share of the burden of carrying stocks, but **NO DEALER WILL BE EXPECTED OR PERMITTED TO CARRY A GREATER STOCK THAN IS REASONABLE AND ECONOMICAL.**

Giving reasons for this new policy, Mr. Sloan, president of the corporation, declares his disbelief in the theory that dealers will sell a greater volume if they are constantly stocked to the limit. He believes that over the "long pull," which is the same as the long run, there is nothing gained by pushing dealers to take cars which they cannot reasonably and economically merchandise.

That word "economically" is very important to this policy. The bankers with whom Mr. Sloan says he conferred before the determination of this policy undoubtedly had something to do with it. There have been many instances of dealers taking cars under pressure when it was necessary for them to borrow money at high rates and pay excessive storage on the vehicles. When the time came that such stocks were salable all possible

profit had been eaten up by interest and storage charges. Such stocking of cars is distinctly uneconomical and Mr. Sloan states that General Motors hereafter will not permit it.

This does not mean, however, that dealers will not be expected to carry reasonable stocks in accordance with seasonable demand. The merchant is one who buys and sells and his service to the public consists in his carrying a stock from which the buyer may obtain immediate delivery. It will still be necessary for the automotive merchant to buy intelligently in advance of his needs and at certain seasons this necessity will be more pronounced than at others.

In winter, for instance, it will still be advisable for the dealer to prepare for spring. The spring months will always bring a stimulated demand for new automobiles as compared with winter, and the dealer who is not prepared to deliver them will suffer. The factories cannot economically adjust themselves so as to speedily turn out all the cars that are wanted after the demand manifests itself. There must be some production in advance and the factories should not be expected to carry all the burden. Dealers can economically stock a certain volume of cars in winter for the spring trade, and the dealer's own banker ought to help him decide just how large this stock should be.

## Advising the Car Owners

THE repair man has many opportunities to advise the car owner. Sometimes his advice is appreciated and sometimes not. A repair man who had just finished an engine overhaul and cylinder regrinding job was being pushed by the owner for delivery of the car. The owner wanted to go on a week-end holiday trip. The repair man was interested in seeing the job give satisfaction. On one pretext or another he was having one of his men drive the car around town, slowly and carefully, "trying it out."

"I would rather have the owner get mad at me than give him his car this afternoon and let him take it out and burn it up," said the repair man.

Of course this conscientious repair man had advised the owner to drive his car slowly and carefully, just as if it were a new car, but he knew the owner on pleasure bent would not heed his advice, and that was why he was resorting to subterfuge to delay delivery of the job. Owners would do well to give more heed to the advice of the honest repair man.

## Joe Boyer

ANOTHER supreme sacrifice for the automotive industry's progress was placed on the records when Joe Boyer met with a fatal accident during the Altoona race on Labor Day. Boyer's death was sad and seemingly untimely and his passing removes from the racing fraternity a man who was generally popular and highly respected.

It would be impossible to compute the value of his contribution to the scientific development of the motor vehicle, but we know this contribution was large. Progress would be slower in the absence of such efforts as his.

Race drivers of the Boyer type are limited in number and theirs stands as a very important division of the modern industry.



# Manufacture Proceeds at Even Pace

## Retailers Well Supplied But In No Manner Overstocked

### New Models Shipped to Dealers Only in Quantities Sufficient to Meet Current Needs

NEW YORK, Sept. 1.—Fewer working days in September may bring about a smaller total output of passenger cars than is estimated for August but present indications do not point to a drop from the manufacturing pace of the past month. Demand has been stimulated by the introduction of new models and shipments have been going forward steadily so that in most cases dealers are reasonably well supplied, without, however, being in any way overstocked.

Repetition of the situation that confronted the dealers in the spring when stocks were high and demand small is being avoided and will be avoided in the future, according to manufacturers' statements. New models have been shipped to dealers only in sufficient volume to take care of current requirements and not against any great demand that may develop.

Manufacturers are proceeding at the same steady gait that has attended operations for the last two months. The early part of August was reported to be slightly better in production than during the corresponding period in July, with schedules stepped up to turn out new models. During the same period sales showed improvement over the previous month though not reaching the level of a year ago.

### Some Farmer Buying

Programs for the remaining months of the year will be governed in a large measure by the extent to which farmers become buyers. There has been some buying on the part of the farmer during the last few weeks according to reports from state and county fairs where automobile shows have been staged but there will be no strong development until after Sept. 1.

Good reports have been received from Illinois towns where farmers attending fairs either placed orders for cars or showed an encouraging attitude toward purchasing in the future. In the past even interest on the part of the farmer has been noticeably absent.

The same brighter prospects are apparent in rural communities of Ohio. In the Northeast section of the country, the horizon is brightening and with the general outlook as it is in farming communities there should be a perceptible movement in the automobile retail market during the fall.

Manufacturers are not giving definite

## Fine Drivers Who Eat Garlic

WASHINGTON, Sept. 1.—Drivers of the "Pedicab," the Chinese taxi, must not eat garlic under pain of a \$100 fine, the Department of Commerce has just been informed.

In addition to their abstinence from garlic, the drivers of the "Pedicabs" which are fast shunting the time-honored rickshaws into oblivion, must wear uniforms and bathe regularly.

The "Pedicab" is in a form of bicycle rickshaw propelled as a push bicycle, the driver sitting in front and working the pedals, while the passenger sits in a "most comfortable carriage behind." They are advertised as cheap, hygienic and fast.

form to schedules for very far in the future. As with dealer stocks, plant surplus of finished cars is being kept down to a minimum.

Tire output continues at a high level for the season of the year and the feeling prevails among some of the producers in the Akron district that the schedules now in force will be maintained with little change during the rest of the year. The pick-up in tire production has been one of the features of the late summer.

### CONTEMPT RULING AFFIRMED

PHILADELPHIA, Aug. 31.—The United States Circuit Court of Appeals, sitting at Philadelphia, has handed down a decision affirming the decision of the District Court rendered last spring, held the Pyrene Manufacturing Co., of Newark, N. J., in contempt of court for violating the permanent injunction granted some time ago to the Moto-Meter Co., Inc., of Long Island City, N. Y., on Boyce patent No. 1,090,776. The District Court inflicted a fine of \$2500 upon the Pyrene company, which was upheld upon appeal.

The device on which the contempt proceedings were based was the Pyrene company's Guardene instrument, similar to that enjoined more than a year ago, but to which the defendant had added a flexible wire mesh extension, alleged to dip into the water in the radiator. The court held that this construction did not avoid the Boyce patent.

### HANDLE MAXWELL-CHRYSLER

FORT DODGE, Ia., Sept. 1.—The Johnson-Laurence Sales company of Fort Dodge, has been named Maxwell and Chrysler distributor in Fort Dodge, succeeding the Fort Dodge Auto company.

## All Chicago Dealers Do Not Share in August Improvement

### July's Pace of Sales Was at Least Maintained if Not Slightly Exceeded Last Month

CHICAGO, Sept. 1.—Business was not up to expectations with some Chicago retailers in August, although with a great many sales for the month were satisfactory and in instances very gratifying. It would be impossible to offer a percentage comparison for local trade's July and August standings but roughly it might be said that July's pace was, at least, maintained if not exceeded slightly by that of August.

Quite a number of dealers complain that August was even under July which was only a little better than June but where these cases brought down the total volume it was swelled by August improvements in other quarters. Business is not coming easy. On the other hand, salesmen are working hard for their commissions and in order to make many of these sales it is necessary for the dealer to allow as much credit extension as he can stand. Many chances to sell cars are turned down because of the prospects' doubtful financial ability.

Stocks of 1924 models are practically cleaned out except in isolated spots. In this regard the Chicago trade is in good shape for merchandising the later designs. Used car stocks are low, speaking generally, and might be lower on the whole than at this time last year. Opinion in the Chicago trade almost unanimously is that the fall and early winter should witness a turn for the better in business. Distributors say farmers are beginning to buy somewhat from rural dealers and it is felt that while the farmer may not be in the market as a sensational factor this year he will demand automobiles to a measurable extent in the final quarter and his crop money will serve to stimulate conditions generally.

### LARGER BIFLEX STATION

CHICAGO, Sept. 1.—The Biflex Corporation has moved its Chicago office and service station from 2335 Michigan ave. to 2334 Michigan ave., where it has twice the floor space as it had at the old location. More room was required, it is said, because consolidation with the L. P. Halliday Co.

### GEHRING MANAGES BRANCH

CHICAGO, Sept. 1.—Ralph J. Gehring, formerly connected with the Chevrolet Motor Co., in both wholesale and retail divisions, is in charge of the direct factory retail branch of the Durant Motor Co., 2440 Michigan avenue, Chicago.



## No Overstocks for Retail, New General Motors Policy

### Demand of Trade Will Rule Distribution, Asserts Sloan

#### Supplies for Field Are to Be Held Down to a Logical and Economic Basis

NEW YORK, Sept. 1.—“Manufacturing schedules will be kept in line with the trend of retail sales as we see it, and no General Motors division in the future will require or permit its dealers or distributors to carry stocks beyond what is logical and economical.”

This is General Motors' future sales policy as announced by Alfred P. Sloan, Jr., president of the big organization to which belong such powerful units as Cadillac, Buick, Chevrolet, Oakland, Oldsmobile, and GMC truck. It follows after a searching personal investigation of dealer conditions by Mr. Sloan and is a logical sequence of the course General Motors has been following for several months in holding down production to meet dealer demands, as borne out by monthly reports on sales to dealers and consumers.

The need was discovered following several big production months last winter when it was anticipated that there would be a record-breaking spring demand. General Motors planning to have sufficient cars on hand to fill all orders promptly. The expected spring demand did not follow and in consequence dealers of all makes of cars were overstocked. Then General Motors cut production sharply and for the last few months retail sales have been about double factory production.

In announcing the sales policy Mr. Sloan goes to considerable length in analyzing dealer conditions as he found them, and his statement shows that he has given considerable time and thought to working out a policy for the various divisions of General Motors to follow hereafter.

#### Mr. Sloan's Statement

Mr. Sloan's statement in full is as follows:

I have noted a number of references in the automotive press recently, dealing with a subject which I believe to be very much in the minds of all automobile dealers; viz., the policy of the manufacturer with regard to stocking of cars by dealers during certain seasons of the year. Recently I have contacted personally with a very considerable number of distributors and dealers, and the subject also has come up for discussion in conferences I have had with bankers in various cities who have direct contact with the subject through the financing of dealers in their respective communities.

Speaking for General Motors, I recognize

that the economic position of the dealer as a whole is not as satisfactory as we would like to see it, and on account of the fact that the dealer is an essential link in the chain of circumstances from the production to the ultimate disposal of any car, manifestly his position must be recognized and soundly established.

I have heard the theory advanced that the dealer will sell more cars if he is stocked to the limit. As a general rule, I don't believe this is so, at least when considered from the standpoint of a long pull over a period of years. On the contrary, any unreasonable burden in the matter of stock thrown upon the dealer organization results in an economic loss and must be reflected in increased discounts and list prices to compensate for the reduced turnover of capital invested in inventories. On the other hand, I believe that any dealer who places any value on the car franchise that he may have is perfectly willing to do his part in carrying a just proportion of such burden as should be carried.

#### Seasonal Fluctuations

Retail sales, representing the movement of cars into the hands of users, is subject to seasonal fluctuations over the course of the year. Should production be allowed to fluctuate to a similar degree, the tendency would be to increase manufacturing costs. Therefore, in the interests of economy, plants should be operated at as level a rate as possible. This requires a seasonal accumulation of stocks in the hands of dealers and distributors. The rapid growth in the proportion of closed cars has served to flatten out somewhat the peak of spring demand. I believe it is possible for the manufacturer to maintain practically a level line of production and yet not subject its dealers and distributors to any undue burden in the matter of seasonal accumulation of stock.

We have given a great deal of study to retail sales statistics of the past and believe we now have a reliable measure of the ordinary seasonal character of such demand, and are in position to gauge the current trend with far greater accuracy than has been possible in the past. General Motors policy has been definitely established. We shall maintain a reasonably level line of plant operation in order to gain a maximum of efficiency in manufacturing costs. The trend of sales to consumers will be appraised monthly and production schedules will be adjusted promptly if there is any indication of an altered trend of retail demand. Manufacturing schedules will be kept in line with the trend of retail sales as we see it, and no General Motors division in the future will require or permit its dealers or distributors to carry stocks beyond what is logical and economical.

### Chrysler Retail Sales During August Well Ahead of June

#### Three Weeks Ending Aug. 16 Sets Record. Maxwell Also Holding Up Strongly

DETROIT, Aug. 28.—Weekly telegrams from all Maxwell-Chrysler district offices indicate that in the three weeks ending Aug. 16, the sale of Chrysler cars to the public exceeded the record of any other three weeks since the introduction of the Chrysler. Retail Chrysler sales in August are running 13 per cent ahead of June, despite the fact that June is usually considered one of the best and August one of the poorest selling months of the year.

Dealer stocks have been brought up to normal in the past four months so that the Chrysler factory will now be relieved of the burden of building up stocks in the face of unprecedented retail demand. The great volume of retail business insures steady production at the factory for the balance of the year. Maxwell sales are also reported holding up strongly despite the season.

Retail sales in August as well as July have been running higher each succeeding week and Maxwell dealer stocks are only six days above the low stock figure of a year ago. In the past four months, dealer stocks have been reduced 50 per cent. This means that increased factory output will be necessary to meet current retail demand.

### Three Factory Branches Are Established by Olds Company

DETROIT, Aug. 31.—Factory branches have been established by Olds Motor Works at Cincinnati, Denver and Minneapolis. The factory is not contemplating extensive branch installation, as it has already signed contracts with distributors in all the other territories.

The Cincinnati branch succeeds the Bovis Oldsmobile Co. Walter Zimmerman, formerly manager of Dallas branch, is in charge. He is succeeded at Dallas by Frank Williams. The Denver branch succeeds Spain-Skinner, Inc. The Minneapolis branch succeeds the Northwestern Oldsmobile Co., with E. F. Glenn in charge.

#### LANGE PRICES ADVANCED

PITTSBURGH, Aug. 28.—The Lange Motor Truck Co. has advanced the prices of their trucks \$200. The following shows the old and new prices.

	Tons Capacity	Old Price	New Price
Model 1½	1½	\$2,750	\$2,950
Model E	2½	3,450	3,650
Model F	3½	4,450	4,650



# Labor Day Race Is Fatal to Boyer

## Duesenberg Driver Dies As Result of Track Accident

### Altoona Contest, Marred by Tragically, Won by Jimmy Murphy, With Milton Second

ALTOONA, Pa., Sept. 2.—Joe Boyer, Jr., millionaire automobile race driver, was fatally injured, and Antoine Mourre, French pilot, narrowly escaped a similar fate in the second annual Labor Day race over the Altoona Speedway.

Boyer died in a local hospital from the effects of his injuries shortly after midnight Monday.

A crowd of 75,000 attended the event, the third in the history of the mile and a quarter board bowl, was sensational, with drivers bunched in every lap, five or six being continually fighting for a top place.

Jimmy Murphy, winner at Altoona June 14 and at Kansas City, won the race, being the only driver to finish the 200 laps, or 250 miles.

Starter Fred J. Wagner flagged all remaining cars on the track when Boyer crashed into the 45-degree raised curve just entering the home stretch. The car hung on the rim of the bowl and gradually worked down the incline, making driving dangerous.

#### Milton Second

Tommy Milton finished second, having completed 199 laps, with Fred Comer in a Durant third, completing 198 laps. Seven of the drivers completed over 190 laps.

Boyer, at the time of his accident, was in the 191st lap, being less than half a mile behind Murphy, the winner. Boyer was driving at a furious rate to overtake the leader, who had a full lap advantage from the 150th lap to the finish. His machine skidded on the turn and the rear end crashed into the fence at the top, tearing away a half dozen 10x12 posts. Both Boyer's legs were crushed at the knee. He remained conscious on a 15-mile drive to the Altoona hospital.

Mourre, three laps before, skidded on the same turn and his car did a nose dive, straightened to the bottom of the rim, hitting the soft dirt a tire blew out but the driver kept on going to the pits. He was in third place.

The summary:

First—Jimmy Murphy, Miller, time 2 hours, 11 minute 8 2/5 seconds.

Second—Tommy Milton, Miller, 199 laps.

Third—Fred Comer, Durant, 198 laps.

Fourth—Phil Shafer, Duesenberg, 197 laps.

Fifth—Earl Cooper, Studebaker, 197 laps.

Sixth—Antoine Mourre, Mourre Special, 193 laps.

Seventh—Joe Boyer, Duesenberg, 190 laps.

Eighth—Raymond L. Calrens, Ira Vall Special, 186 laps.

## Pike's Peak Race Won by Loesche

DENVER, Colo., Sept. 1.—Otto Loesche, of Connorsville, Ind., won the Penrose Trophy Cup permanently in the Pike's Peak race by driving a Lexington car 12½ miles in 18 minutes and 15 seconds. Charles H. Myers, of Colorado Springs, in a Studebaker, made second place in 18 minutes 15 2/5 seconds. Both broke the previous record of 18 minutes 24 7/10 seconds, made by Ralph Mulford in 1916.

There was an inch of snow on the upper stretches and a temperature of 24 degrees. The first two cars escaped fog and hail which handicapped the others.

Other racers, H. S. Brinker in Peerless, 18 minutes 55 4/5 seconds; Clarence Lawton in Lexington, 19 minutes 5 4/5 seconds; A. M. Cline in Lexington, 19 minutes 38 4/5 seconds; C. M. Hubbard in Hudson, 22 minutes 4 seconds; R. Anderson in Oldsmobile, 24 minutes 34 seconds; W. F. Frammel in Packard, 24 minutes 41 1/5 seconds; Angelo Julianio in Hudson, 25 minutes 16 1/5 seconds; A. C. Alger in Allen, 26 minutes 38 1/5 seconds; Ott Davis in Chandler, 27 minutes 22 3/5 seconds; H. L. Chapin in Dodge Brothers, 35 minutes 54 1/5 seconds; Robert Rudd in Lexington, Robert Back in Essex and Roger Pendergraft in Essex failed to finish.

Ninth—Robert McDonogh, Miller, 184 laps.

Tenth—Harry Hartz, Durant, 177 laps.

Unfinished, Harlan Fengler, Durant, 171 laps; Hill drove relief from 134th lap until end. Bennett Hill, Miller, quit race 49th lap, spark trouble. Peter Depaolo, Duesenberg, ended 92nd lap, paper thrown on track lodged in engine. Wad size of a walnut removed. Ernie Ansterburg, Duesenberg, who established a world's record of 125.7 miles an hour in qualifying trials, ended race on 79th lap, engine trouble.

## CADILLAC MANAGERS MEET

DETROIT, Sept. 1.—District managers of the Cadillac Motor Car Co. held their annual convention at the factory last week. H. H. Rice, president, and Lynn McNaughton, vice-president, in charge of sales, presided over the sessions.

## REPRESENT KISSEL

WASHINGTON, Aug. 31.—The Davies Motor Company has been appointed representatives of the Kissel Customs Built Six for Washington and vicinity.

## Say Factories Are Beginning to Feel Used Parts Retailing

### Growing Practice By Dealers in Merchandising Salvaged Units, However, Held to Be Legitimate

DETROIT, Sept. 1.—Increasing sales of used parts throughout the country is beginning to be felt by the service departments of factories. Dealers in a number of lines are reported as installing used parts departments; the stocks for these being made up of good parts from used cars which dealers dismantle. These parts are being offered for sale at much lower figures than the parts in the regular service departments and are finding an increasing market.

#### Study Situation

Several makers have had their attention brought to the fact that their dealers are selling salvaged parts of this kind in competition with the regular parts from the factories and are studying the situation for its present actual effect on their service business and what it may develop. The present view is that it is a legitimate procedure as conducted, and aiding the dealers somewhat in their used car work. It will not, however, be permitted to extend to the buying of used parts from other sources, and their resale in conjunction with a regular new parts business.

The condition applies chiefly to the lower priced lines as at present reported, with, however, some activity in medium priced lines in which there are many older models in operation.

## Merchandising Meetings on Month's Slate in New England

CHICAGO, Sept. 1.—Seven showings of the film "Profitable Maintenance," sponsored by the Automotive Equipment Association, will be made in New England during September. Details for a series of merchandising meetings to be held in connection with the film's presentation are being worked out by Automotive Booster's Club No. 1 of Boston. Invitations for the attendance of accessory dealers, car dealers, repairmen and others in the industry have been issued and it is expected that the events will all be accorded good turnouts. Arthur R. Mogge, merchandising director of the A. E. A., will talk at each meeting. The schedule of New England meetings for this month are as follows: Sept. 12, Boston; 13th, Providence, R. I.; 15th, Bangor, Me.; 16th, Portland, Me.; 17th, Worcester, Mass.; 18th, Springfield, Mass.; 19th, New Haven, Conn.



## Railroad, Motor Coach Bus, and Truck Slated for Forum

**Strong List of Speakers on Program  
S. A. E. Helps Arrange for  
Sept. 18-19 in New York**

NEW YORK, Sept. 1.—Under the auspices of the Society of Automotive Engineers and the New York Railroad Club, a two day group of meetings will be held here Sept. 18-19. Design, operation and maintenance of motor-driven railroad coaches, motor buses and motor trucks will be discussed at these sessions.

One of the leading speakers will be James Paterson, of London, England, managing director of Carter-Paterson, Ltd., one of England's leading firms of shippers which has developed operating methods, vehicles, bodies and trailers to a high degree. Mr. Paterson's paper will be presented Friday evening, Sept. 19. J. A. Hoffman, vice-president of the Motor Haulage Co., of New York City, which has recently become associated with the Long Island Railroad in the handling of less-than-carload shipments in the Metropolitan area, will be another speaker. H. W. Howard, transportation engineer of the General Motors Corp., will describe engineering features of trailers and semi-trailers for motor transport service.

J. W. Cain, manager of purchases of the American Short Line Railroad Association, who has experienced with gasoline propelled rail cars for years, will talk Friday afternoon also, while that evening W. L. Bean, mechanical engineer of the New York, New Haven & Hartford Railroad, will treat on rail cars in his paper.

### First Day for Bus

The first day, Thursday, will be given over to the bus in morning and afternoon sessions at the Pennsylvania Hotel. One of the papers will be presented by F. D. Howell of the Motor Transit Co. of Los Angeles, which is running 125 cars in local and through service over 800 miles of highways radiating out of Los Angeles, operating its own maintenance, assembly and body building shops.

V. E. Kennan, superintendent of the bus division of the United Electric Railways Co., of Providence, R. I., and J. B. Stewart, Jr., general superintendent of the Youngstown Municipal Railway Co., of Youngstown, O., will contribute the operating experiences of two public utility organizations that have found it profitable to install motor bus service. W. F. Evans, president of the Detroit Motorbus Co., will present certain of his views on bus design and operation.

The first meeting of the Washington section of the S. A. E. will be held at the Cosmos Club Sept. 26. The speaker will be Thomas Midgley, Jr., and his subject will be "The Chemical Control of Gaseous Detonation."

## Lawful for Blind Man to Drive

LOUISVILLE, Aug. 31.—No legal bar exists in Louisville and Kentucky to prohibit a blind man from taking out a license to operate an automobile, Capt. John Loran of the Police Traffic Bureau, was told by R. P. Dietzman, City Attorney.

Captain Loran sought legal advice as to whether he could forbid a jitney bus driver, blind in one eye and with failing sight in the other, to operate his car.

Mr. Dietzman told Captain Loran that the statutes say much about automobiles, a little about who may obtain a license, but nothing about the physical fitness of the applicant. He advised that if the man continues to drive he will be arrested and charged with breach of the peace, providing his one eye is as bad as it is thought to be.

## Orders Booked Like in "Good Old Days" at Aurora, Ill., Fair

AURORA, Ill., Aug. 31.—The greatest mid-summer automobile show and agricultural implement display in the history of Illinois occupied the attention of thousands of visitors to the Central States Fair and Exposition here and brought happy smiles to the salesmen who were booking orders and prospects in lists that lengthened out like in the good old days, before the agricultural depression sent the farmer-buyer into hiding.

For the first time, the automobile men presented their cars in a permanent show place for the baggy canvas top has given way to a fine automobile pavilion and dealers vied with one another in tasty displays. There were 100 cars on the floor.

### DEALERS INCORPORATE

TULSA, Okla., Aug. 31.—Tulsa-Rickenbacker Co., capital \$25,000, has been incorporated here by F. M. Brown, H. R. Shark and A. G. Dillabaugh.

## Optimism Prevails Among Southern California Dealers

**August Not Much Better Than July  
But Good Signs Loom Indicating Better Business**

LOS ANGELES, Sept. 2.—Southern California automobile dealers have the optimism of the miners of '49. If business is not found good today they are confident it will be tomorrow. August showed very little, if any, improvement over July in respect to sales. More inquiries were reported and the number of prospective purchasers seems to be increasing. The finance companies report they are experiencing considerable difficulty in making collections.

The ratio of loss in automotive sales as compared with August last year approximated 25 per cent.

One of the surprises of the summer selling season is that some of the oldest and best known makes of cars are not keeping pace with the newer products in respect to sales. Representatives of these cars say they are unable to account for the situation except on the basis of price and innovations in construction offered by the newer lines which their cars do not have. The demand for four-wheel brakes and balloon tire equipment is very pronounced and it is reported that dealers representing cars without these features or those which furnish them at extra cost only are being handicapped.

The demand for closed cars never was as pronounced in a summer season as this year. Those lines offering closed models at the same or but a slightly increased price over that of open models are enjoying a stimulated business. The demand for the higher priced cars seems to have weakened and dealers are resorting to heavy advertising trying to influence trade.

### OPEN USED CAR PLACE

ST. LOUIS, Sept. 1.—St. Louis, Mo. Hudson-Roberts Motor Car Co. of Clayton, a St. Louis suburb, Hudson and Essex dealer, has opened a new used car show room at 2936 Locust street in charge of W. H. Lofland.

## Find Only One Out of Six Look for Train When Crossing Railroad Track

BALTIMORE, Md., Aug. 31.—One out of every six automobile drivers crosses railroad tracks without looking to see if a train is coming.

For four years the Baltimore and Ohio, which crosses nine States stationed observers at important road crossings to see how motorists crossed the tracks.

Of the 1,834,809 who were observed, 336,937 drove carelessly, risking not only their own lives and property, but also the lives of those traveling with them.

The railroad observers took the numbers of the careless drivers, looked up their addresses and sent them post cards, warning them of the danger of careless driving at railroad crossings.

Most of the crossing accidents may be blamed to—

1. Trying to beat the train to the crossing, and,
2. Poor judgment.



## Willys-Overland Profits for Half Year Put at \$2,781,692

Figure Compares With \$7,900,000 in Same Period Last Year—Financial Condition Excellent

TOLEDO, Aug. 30.—Earnings of the Willys-Overland Co. for the first half of the current year were \$2,781,692, comparable with \$7,900,000 in the same period last year, according to the condensed balance sheet issued by President John N. Willys.

This is equivalent to about \$12 a share on the preferred and is compared with \$35 a share earned in the same period of last year. Slackness in the industry during the second quarter of the year is largely responsible for the decrease in volume of earnings but price cuts have had some effect, too.

During the period sales totaled 98,779, of which 77,699 were Overland and 21,060 Willys-Knights. This is compared with sales of 200,000 in the same period last year.

Despite the smaller volume of current business the statement shows excellent financial condition. Cash on hand is \$2,723,920; notes receivable \$4,772,663, and merchandise inventories \$31,938,106. A million dollars of the gold bonds were retired July 15. Current liabilities totaled \$7,458,508, which gives a ratio of more than five to one of net quick assets to liabilities.

### Permanent Assets \$27,275,277

Land value \$1,749,567 and buildings and machinery totaling \$41,071,666 have been depreciated by \$13,525,730, bringing the total permanent assets to \$27,275,277. Patents have been written off. There are deferred charges to insurance, taxes and unexpired bond discount amounting to \$1,273,289. The profit and loss surplus is \$16,457,669.

Dividends on the cumulative preferred stock since October 1, 1920, amounting to \$5,787,993 are unpaid.

Current liabilities are less than half what they were a year ago and merchandise inventories have increased only about ten per cent.

Net tangible assets per share of preferred stock have been gradually increasing in the last three years. A year ago they stood at \$184 per share and today about \$235 a share as compared with \$150 a share at the end of 1922.

Car sales have lately been on the increase and gradual building up of production schedules calls for about 40 per cent increases in the present working force in the next few weeks.

There are more than 4,500 men now at work at the local plant.

### DISTRIBUTES STAR DURANT

LOS ANGELES, Sept. 1.—Walter M. Brown, one of the oldest dealers in Los Angeles, has been put in charge of the Durant distribution in Southern California. Mr. Brown also has the agency for the Star.

## Make Armored Mail Trucks In Philadelphia For U. S. Postal Service In Eastern District

Bulletproof Vehicles Similar to Those in Limited Use to be Employed More Extensively for Bank and Registered Parcel Delivery

PHILADELPHIA, Aug. 31.—Improved armored mail trucks for delivery of bank and registered mail, to be put into service at large postoffices throughout the Eastern district, are being manufactured in this city at the postoffice department's garage shops at 43rd street and Woodlawn avenue. Three of these trucks are now in service in this city and about 20 more are being used in New York, Boston, St. Louis, Chicago and other cities. Frank A. Fay is designer of the vehicles and he says a new model truck is contemplated.

The armored truck has a bullet-proof cab of high grade steel, equipped with a protected windshield made of bullet-proof glass, about 7/8 in. thick. Apertures furnished with steel shutters are placed in the walls of the truck at intervals, through which aim may be taken at attacking bandits. In case of a hold-up, an automatic siren is set in operation by the driver, which blows a warning until assistance arrives.

Another feature of the truck is the pro-

vision made in its design for preventing boarding it while in motion. Fenders have been eliminated, as have running boards and all other places where foothold might be obtained when the truck is in motion. The sides, too, are bare of handles, or supports. Entrance to the cab is possible only when the truck has been stopped and the steel doors unlocked from the inside. The truck is manned by a driver and two guards, all armed. The tail-gate is locked automatically from the inside when the truck has been loaded. The practicability of the truck is said by Mr. Fay to have been demonstrated by rigid tests at Fort Meyer, Va. Bullets were fired at the cab from all directions and penetrated neither steel nor glass. The proposed improvements in design will take into consideration the problem of increased ventilation without endangering the impregnable feature of the cab, as well as an innovation in the armored windshield to increase road visibility for the driver.

### DISTRIBUTOR EXPANDS

TOLEDO, Sept. 1.—Willis Day, Flint distributor at Toledo, has taken a long-time lease on the building at Madison avenue and Fifteenth street formerly occupied by Haynes. The move marks expansion in the Flint business here for Mr. Day has been given five more counties in this part of Ohio, making his territory include 15 counties. Mr. Day is putting on a miniature automobile show as a part of his moving program to show all Flint models.

### MANAGES FLINT RETAIL

LOS ANGELES, Sept. 1.—Terry G. Golden, formerly of San Francisco, has been appointed retail sales manager of the Durant-Stevens Motors, Inc., Flint distributors for Southern California, succeeding F. H. Schriener who has become associated with the Hudson and Essex. Jack Cadman has been appointed wholesale manager for the Flint in Southern California.

### BUY YELLOW FLEET

ST. LOUIS, Mo., Sept. 1.—The Brown Taxicab Company has purchased the fleet of 97 Yellow Cabs in use in St. Louis. This purchase gives the Brown Company 251 cabs, the largest taxicab fleet west of the Mississippi River.

William J. Brown is president of the Brown Co. and J. R. Catchcart secretary and treasurer.

## Illinois in Drive for Record Year in Hard Road Building

SPRINGFIELD, Ill., Aug. 31.—Hard road contractors in Illinois continue to push their drive for a new world's record for one year's construction. A report issued by the State Division of Highways shows that there had been completed up until Aug. 21 of the present year, 706.14 miles of pavement.

The total mileage of pavement completed thus far this season is now 110 miles in excess of the mileage completed on the same date of last year. Construction progress is at present running a full three weeks ahead of last year's program.

During the week ending Aug. 21, 118 paving mixers were operating on the highways throughout the state, 10,500 men and 2,900 teams were employed directly on road work. In the same week, 44.66 miles of pavement were completed.

### TAKES ON HIMICO

MOLINE, Ill., Sept. 1.—Agency of the Himico three and four speed replacement power plant has been added to the business of the Moline Motor Bearing company which is now producing approximately 500 Ford connecting rods daily. Announcement of the new agency was made by E. W. Stratton, general manager. The motor bearing company has as much work as can be handled at present, he said.



## A. E. A. Hangs Up Awards for Best Xmas Window Displays

**Equipment Gifts for Yuletide Must Be Stressed by Offerings of Contest Participants**

CHICAGO, Sept. 1.—A window trimming contest in which \$500 in prizes will be awarded for the best trimmed windows featuring automotive products as Christmas gifts is being sponsored by the Automotive Equipment Association, according to announcement by Arthur R. Mogge, A. E. A. merchandising director. A similar contest held last year was pronounced highly successful.

It is stated that the contest is open to all accessory dealers, car dealers, garage men, service station proprietors and others engaged in resale of automotive equipment and service anywhere in the United States or Canada. Every window must have displayed in a prominent place at least one large card or streamer reading, "GIVE SOMETHING FOR THE CAR THIS CHRISTMAS," it being ruled that similar phrases will not be accepted to make the picture submitted eligible for competition. The whole idea is to promote the equipment gift suggestion.

### Prize List

The cash awards will be distributed as follows: First prize, \$150; second prize, \$100; third prize, \$75; fourth prize, \$50; fifth prize, \$25. The next ten will receive \$10 each.

Judges will be A. V. Comings, Editor Motor World, David Beecroft, Editor Automobile Trade Journal, Ray W. Sherman, Editor Motor, Ken Cloud, Editor Jobber Topics, Ray P. Sloan, of Automobile Topics, Stanley P. McMinn, Editor Automotive Merchandising, Sam Shelton, Editor Motor AGE.

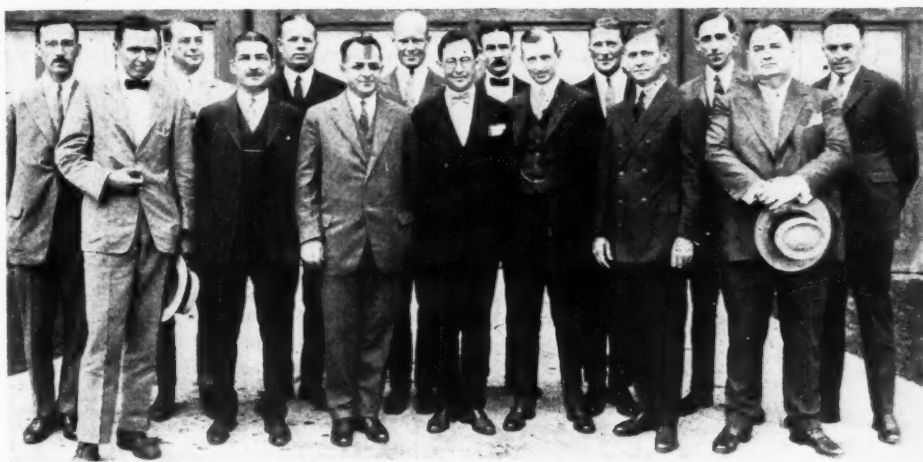
The contest will close at 5 p. m., Dec. 24, no photographs received after that time being eligible. Full details can be obtained from the A. E. A.

### LONG IDLE PLANT TO RESUME

LANSING, Aug. 31.—Truck Sales & Service Co. has been formed with headquarters at Lansing, to sell and service trucks built by Triangle Truck Co., which company recently announced it was preparing to resume production after a lay-off of several years. Only two models will be built, ton and half and two ton and half, but the company plans special service on bodies and equipment.

Officers of the sales company are L. R. Brown, president and general manager; Alfred Burk, vice-president, and Frank Steinbower, secretary and treasurer. It is capitalized for \$50,000. Mr. Brown will also manage the Triangle plant at S. John's. Two agencies have been opened in Wisconsin, the company reports, and it is planning to build up a general dealer organization.

## Locomobile Branch Managers Recently in Business Session at Bridgeport Factory



## Many Large Garages to Be Constructed in Philadelphia

PHILADELPHIA, Aug. 31.—A big increase in permits calling for large public garages in many parts of the city is noted. These include: A \$35,000 brick and steel garage on a site 144x114 feet, for Chait Bros., at Evergreen and Swayne avenues; \$30,000 garage for Walter Smith, on a site 102x120 feet, at Twenty-fourth and Reed streets; \$30,000 garage and showroom for M. B. Willing and F. Shrolie, two stories, on a site 133x67 feet, at Eighteenth and Jackson streets; \$24,000 garage for Berger & Wernick, at 6031-6041 Larchwood avenue, brick and steel, on a site 110x90 feet; \$25,000 garage for Charles T. Williams, on Fillmore street, near Duffield, on a site 110x80 feet; \$22,000 one-story garage for B. W. Glover, at Belfield avenue and Tulpehocken streets; garage for S. Sobel, at Twenty-fourth and Wharton streets; garage for Hyman Pepper, two-story brick and steel, on a site 84x64 feet at Clearfield and Frankford; \$15,400 addition for John Trainor's garage at 534 West Olney avenue; \$25,000 garage for Babis & Bender, on a site 196x65 feet, on Fifth street, south of Shunk, and numerous small public garages costing from \$3,000 to \$4,000. Community garage construction is still active, but the larger type of public garage has forged far ahead.

### BUICK APPOINTMENTS

ATLANTA, Ga., Aug. 31.—The Buick Motor Co. Atlanta branch announces the appointment of the following new agencies:

Christensen Motor Co., of Beaufort, S. C., headed by Neils Christensen, for many years United States Senator from South Carolina who has retired from politics. The company will act as distributors in two of the South Carolina counties.

Rushing & Harris, of Vidalia, Ga., dealers. The Turner-Todd Motor Co., Mobile, Ala., distributors.

### REEVES HONORED IN GERMANY

NEW YORK, Sept. 1.—Alfred Reeves, general manager of the National Automobile Chamber of Commerce, who is investigating automotive conditions in Europe, was tendered a dinner in Germany by the manufacturers' organization, the Reichserband der Automobile industrie, and the dealers' association, the Deutscher-Automobil-Handler-Verband, N. A. C. C. headquarters here is advised.

At this dinner need for more motor transportation in Germany was emphasized and Mr. Reeves was informed that at the present time Germany has only one motor vehicle to every 400 persons in comparison with the ratio of 1 to 7 in the United States. There are 60 motor vehicle manufacturers and 1,900 dealers and at present cars can be imported only under permit except in the occupied territory, which is open. The Germans, Mr. Reeves was told, are preparing for their big show which opens Sept. 26.

### FLINT ADDS DEALERS

FLINT, Mich., Sept. 1.—T. S. Johnston, General Sales Manager of the Flint Motor Company, makes announcement of the following new dealers: Burt C. Shipley Hilleboro, Ore.; Tom Poole, Nampa, Idaho; B. O. MacDonald, Tekamah, Neb.; J. A. Boberg, Harvard, Neb.; Driscoll Motor Co., Nebraska City, Neb.; J. B. Rossiter, Walthill, Neb.; Ahlberg Auto Co., Odebolt, Iowa; Motor Inn, Kearney, Neb.; Medford Centre Garage Co., Inc., Medford, Mass.; Adelbert L. Miles, Rockland, Me.; Borghensani & Capponcelli, Plymouth, Mass.; W. T. Fox, 2200 California St., Denver, Colo.; Bjorling & Erickson Motor Co., Willmar, Minn.; Tiffin Flint Co., Tiffin, O.; Northwestern Motor Sales, 5456 N. Chicago Ave., Chicago; McInerney Motor Co., 2715 N. Cicero Ave., Chicago; Peak Motor Sales Corp., 6239 S. Ashland, Chicago; Ahart & Wagner, Waukegan, Ill.; Claude Carpenter Impl. Co., Lake Odessa, Mich.; Pottsville Flint Co., Pottsville, Pa.; Pennedum's Garage, Gallicoon, N. Y.; Tarrytown Flint Co., Tarrytown, N. Y.; Henry Kohler, Maybee, Mich.; Knox L. Haynesworth, Greenville, S. C.



## Hartford Hupp Distributor Celebrates Contest Victory

**Sixteen Members of L. & H. Organization Are Among Leaders in Nationwide Sales Event**

HARTFORD, Conn., Sept. 1.—The L. & H. Motor Co., Hartford, Conn., Hupmobile distributor in seven of the eight counties of the state, won first prize in the country-wide contest in progress during May, June and July, a fully equipped Hupp sedan.

Observance of the contest victory and of the fifth anniversary of the founding of the agency took place at Heublein Hotel. Preceding this event stockholders and directors had a business meeting at which a substantial cash dividend was declared.

Major Thomas W. Campbell, president of the L. & H. Motor Co., was presented with a silver service by the stockholders and directors in testimony of the efficient work he has given the organization.

Major Campbell announced the winners in the prize contest made by the distributor direct. Of the many salesmen throughout the country 16 men in the L. & H. organization are among the leaders.

### Presented Grand Prize

As the salesman selling the largest number of cars Albert M. Mitchell, of Hartford, was awarded the fully equipped Hupmobile sedan and \$300 in cash. The second prize of \$200 in cash was won by Lester Ramsay of the Hartford branch, and the third prize of \$100 in cash was won by A. L. Martelle of the L. & H. New London branch. A silver loving cup for the associate dealer selling the most cars went to Mohen & Amidon of Hartford. A silver loving cup for the state associate dealer selling the most cars went to Gilmore & Moody of New Haven. One hundred dollars in cash to the associate dealer salesman with the best record was awarded to Fred J. Hansen of Mohen & Amidon of Hartford. Mayor A. M. Paonessa, of New Britain, drew down the \$100 cash prize for the state prize.

The L. & H. Motor Co. began business five years ago with a smaller salesroom on High street. The organization prospered from year to year and today is one of the largest concerns of its kind in the East. From Hartford county the territory has now expanded to seven of the eight counties of the state. A direct branch of the company is maintained at New London.

The sales and service building remodeled a little over a year ago has been outgrown and a full addition for the second story is being planned and work on it will begin shortly.

### INCREASE POWER CAPACITY

DETROIT, Aug. 21.—The Kelsey Wheel Co. is increasing the capacity of its power plant by the installation of a Taylor stoker with steam ash dump under a 500 h.p. boiler.

## Tradesman Up for Governorship

BOSTON, Sept. 1.—In a few more days Massachusetts people will know whether they are going to have for governor for the next two years a successful automobile man.

Lieutenant Governor Alvan T. Fuller, one of the pioneers, and distributor in Eastern Massachusetts for Packard, is a candidate for governor in the primaries.

More than 250 distributors, and their executive and sales staffs, gave Mr. Fuller a dinner at the Boston City Club a few days ago which was one of the biggest events of the campaign.

Nomination in the primaries is equivalent to election.

## Many Applications Accepted by National Parts Association

CHICAGO, Sept. 1.—Excellent progress toward a permanent organization is being made by the National Standard Parts Association, following the preliminary meeting held in Detroit last May of manufacturers and jobbers of dependable replacement parts. At that time an executive committee was named and empowered to pass upon all applications for membership in the permanent organization, these applications to come up for final action at a meeting to be held in Chicago during the week of Nov. 10.

To date 22 replacement parts jobbers and 19 parts manufacturers have been accepted for membership by the executive committee, and 12 applications are now under consideration. One application has been declined.

### CONTROLS BUICK AGENCY

SPRINGFIELD, Ill., Sept. 1.—A. H. Penewitt has bought out his partner, A. J. Dohle in the Springfield, Ill. Buick company, and is now sole proprietor of the business. Mr. Penewitt is a veteran Illinois Buick dealer having handled the car in Mason county since 1908. The partnership has existed five years.

### ADD DAVIS TO LINE

RICHMOND, Indiana, Sept. 1.—Burch-Buell Motor Corp., Rochester, N. Y., long established Chevrolet distributors, have signed contracts for handling the Davis Motor Car in Rochester and the surrounding territory and their initial shipments have been made.

### NAMED BY CHEVROLET

LOS ANGELES, Sept. 1.—The Chevrolet Motor Co. has appointed Hayes B. Eckert as its factory representative in Los Angeles. Eckert has been a Chevrolet dealer and president of the associated dealers representing that car in Los Angeles.

## Paige-Jewett Dealer-Dinners Only Ones Set for Trade Days

**No General Move to Change Schedules for Concentration Friday and Saturday Before Opening**

DETROIT, Aug. 26.—Plans for dealer dinners and meetings at the coming National shows at New York and Chicago indicate no action toward moving these up to the scheduled trade days set for the Friday and Saturday preceding the general opening. With the exception of the Paige-Jewett dinner-meetings, which will be held on the Saturday of the trade days, in both New York and Chicago, there has been no advancing of any of the usual dinners.

Probably the principal reason why there will be no concentration of these dealer events on the trade days, is the fact that there is not enough banquet hall space. This condition applies more particularly to Chicago, but even in New York there would be difficulties in making satisfactory arrangements, factory executives declare.

Furthermore, most of the arrangements for dinners at the coming shows were made previously to the announcement of the trade day plans, several of them being arranged immediately following the dinners at the last shows. Had earlier knowledge of the change in show plans been received, many meetings could have been held on these days.

### Paige Company Plans

The Paige company, through H. M. Jewett, its president, who is also chairman of the N. A. C. C. show committee, in announcing the holding of its dinners on the trade day nights, says it is doing this to bring to the trade days all the co-operation it can. All of its dealers will be brought to the shows on these days with the Saturday dinner and meeting as a special attraction. All of its wholesale business will be transacted in these two days, the company declares, leaving the balance of the week to retail work.

Dodge Brothers show week plans, though not yet fully set, are for an expansion of the dealer activities it initiated last year. It will have the private exhibit for dealers running all through the week, bringing in dealers by groups each day. Hupp, Oakland, Oldsmobile, Chevrolet and Rickenbacker dinners and luncheons will be held through the week. In each of these cases show week headquarters will be maintained until after the dealer meetings, as in former years.

These are the only companies in this district which have regular show week dinners. Other companies, and these as well, look for a larger attendance of the local dealers on the assigned trade days, but feel that the outlying dealers will scatter through the week much as formerly. Effort will be made, however, to bring as many dealers as possible in on the opening days so that the trade day plan may get the fullest possible support.



## Prosperity Signs Urge Marmon to Broaden Production Plans

**Will Expand Force as Rapidly as Possible and Boost Output 50 Per Cent**

INDIANAPOLIS, Sept. 1.—Planning a production increase of 50 per cent for the 1924-1925 season, Nordyke & Marmon Co. announced it had lately built up its force of 1,000 men and would expand the force to 2,500 as rapidly as skilled workmen can be obtained.

The rearrangement of the plant and the revamping of the entire production layout has recently been completed to enable the company to meet its increased schedule for the coming year. The new layout and facilities will speed up manufacturing.

President G. M. Williams, who personally directed this work, returned from a swing around Marmon distributing points to find the plans worked out and everything ready to launch the increased production drive. It is said that \$4,000,000 will be expended in labor on the new production schedule and about \$1,500,000 on materials at the local plant.

The extension program initiated because of the expected improvement in economic conditions the world over, which are beginning to materialize. The foreign outlook has improved so much recently that a short time ago the company sent a special representative to Europe to make a survey and re-establish Marmon distributing points. This work was entrusted to Frank K. Hambly.

"Material improvement and prosperous conditions" were observed throughout the West, Pacific Coast and the Southwest by President Williams on a six-week investigation trip. "Prosperity is bound to come to that entire region," said Mr. Williams, "according to all the signs and evidence."

## Many Machines Fail to Make Good Scores in Brake Tests

WASHINGTON, Aug. 31.—A number of motorists who had visited service stations to have their brakes relined and adjusted just prior to taking the brake tests here by Bureau of Standards engineers failed to fall in either the "good" or "excellent" class, the tabulation shows. A few of these drivers made two and three trips to their service stations before the brakes in their automobiles were able to get into the good or excellent class.

Of 168 automobiles examined for service brakes, the engineers rated them as follows: Poor, 32, average stopping distance, 58.5 feet. Fair, 39; 41.6 feet. Good, 68; 34.8 feet. Excellent, 29; 27.2 feet.

Of 148 automobiles tested for hand or emergency brakes, the results were: Poor, 99; average stopping distance, 62.4 feet. Fair, 20; 42.7 feet. Good, 24; 34.8 feet. Excellent, 5; 29 feet.

## Pinched For "Theft" of His Own Car

HARTFORD, Conn., Aug. 31.—A false alarm that a car had been stolen was turned in to the Hartford police one evening by a clock-maker. Detective Sergeant Lowe, knowing the shortcomings of some drivers, asked the owner if he did not leave his car "somewhere else."

The owner was certain he did not. However, he walked around the block and found his car just where he had left it. He had simply forgotten the spot. Then he started for home. He did not get far when another traffic policeman arrested him on a charge of stealing his own automobile. He could make no complaint, at least, about lack of speed on the part of the police in broadcasting his reported theft.

## Gardner Output in July Much Behind Dealer Orders

ST. LOUIS, Mo. Sept. 1.—The Gardner Motor Car Co. has advised its dealers by letter that July production was hundreds of cars behind orders and that the company will not be able to make immediate shipments for some time to come.

"In order to guard against our dealers becoming overstocked, we are building cars only as the orders come in," the letter states. "In other words, we are not building a lot of cars and forcing the dealer to push himself to the limit to sell them."

## CARLMARK LEAVES AUBURN

MOLINE, Ill., Sept. 1.—E. F. Carlmark, recently district service manager of the Auburn Automobile company of Auburn, Ind., has been appointed manager of the local branch house of the Moline Plow company, succeeding R. K. Baker, resigned. Mr. Carlmark was at one time sales manager of the Stephens automobile division and also European manager of the plow department.

## DROPS DISTRIBUTORSHIP

LOS ANGELES, Sept. 1.—Conan A. Doyle has resigned as general sales manager of Union Motors, Inc., Maxwell distributors in Southern California, to become general manager of the Home Oil Co. of Cal., with headquarters in San Francisco.

## MORE ROOM FOR MOON SALES

ST. LOUIS, Mo., Sept. 1.—Growth in sales of the Moon car in St. Louis has resulted in the Moon Company moving its new car showroom to larger quarters at 3114 Washington Avenue. Carl Fritz is city sales manager.

## Greater Flow of Wealth in Texas Brings Sales Pick-Up

**Automobile Dealers Take Advantage of Improved Conditions and Are Going After Business**

DALLAS, Tex., Sept. 1.—The marketing of a \$70,000,000 grain crop, the disposal of a \$20,000,000 vegetable and a \$5,000,000 fruit crop and the beginning of the movement of a \$500,000,000 cotton crop in Texas is being plainly felt in the automotive industry of the state. These crops, with a \$10,000,000 rice crop and the continual movement of millions of dollars' worth of oil, lumber and cattle, have put much money in circulation and will put millions more in circulation within the next sixty days.

Money matters are easier in Texas than they have been in ten months. Farmers are liquidating accounts and putting money in the banks. Merchants are more confident of the future and everybody is optimistic. Dealers consequently have been going after business in the past 30 days. Sales of new cars within the past 30 days have been 12 per cent greater than for the 30 preceding days. They were some 18 per cent better than for the same period last year.

## Many Cars Placed

In San Antonio more than 2,100 cars were sold in 30 days. Houston dealers sold more than 1,100 new cars. Dallas dealers sold a little more than 1,300 new machines. Fort Worth dealers delivered around 1,000 new machines, Waco sold 700, Galveston 300 and Wichita Falls and Amarillo about 450 each. The used cars sold in these cities were about twice the number of new machines.

Dallas retailers say the value of new cars sold here in the past 30 days was more than \$1,000,000. They predict the trade will be better for the remainder of the year.

The dealers are going after the trade in the rural districts. The farmers will be the biggest buyers this fall, dealers say.

## 100,000th Car for Export Sent to Sydney, Australia

TOLEDO, Aug. 31.—An event of considerable importance in the history of the Willys-Overland Co. took place a few days ago when the 100,000th car to go into export trade was dispatched from the factory by way of New York to Sydney, Australia.

The John N. Willys Export Corp., which was founded in 1919, handles all of the foreign business and through its methods has made the Overland one of the popular overseas cars.

It is a coincidence that the late E. G. Eager at Brisbane, Australia, was the first Overland overseas distributor and handled the first Willy-Overland sold in Australia. The 100,000th car was a Willys Knight country club model.



## Ford Tries New Method for Selling Weekly Payment Plan

### Detroit District Scene of Motor Company's Experiment

#### System Greatly Simplifies Work of Dealer in Securing Enrollments for Installment Purchases

DETROIT, Sept. 1.—A new method of selling the Ford weekly payment plan to prospective car purchasers, including systematizing the collections and follow-up work incidental to the plan, is now on trial in the Detroit branch district. If successful in the work it has set out to do, the plan will be extended to every branch district in the country.

Though working with dealers in obtaining enrollments, the new plan sets up a sales movement independent of dealers, whereby Motor Buyers, Inc., a Detroit car financing organization, is privileged to sell the weekly payment plan direct to car buyers, for which it receives a 2 per cent commission on the delivery of the car by the dealer.

Under the plan the work of the dealer and his salesmen in selling enrollments is greatly simplified. They simply sell the prospect a specially devised payment book for which he makes an original payment of \$5 and makes subsequent payments through any bank whatsoever co-operating under the plan.

#### Central Depository

The finance company figures in the plan in several ways. Primarily it becomes the central depository for all funds paid from enrollments. The banks receive a 1 per cent collection fee. The finance company pays this and also pays 4 per cent to depositors. It has the use of this money for its financing of sales, thereby relieving it of the necessity of borrowing from banks.

Selling enrollments itself, the finance company, as stated, receives 2 per cent commission from the dealer on delivery of the car. Selling its books to dealers, for them in turn to sell to prospective buyers, the finance company receives \$3 for each book. This about covers the cost of preparing the book and the cost of the collection and follow-up work which is part of the service.

Under the revised plan all weekly payment accounts are in the hands of Motor Buyers, Inc. Each enrollment is listed there under a separate folio and all payments are credited as received. Those falling behind in payments are checked up and urged to resume. A regular campaign is designed to keep subscribers interested in completing their payments and to solicit them to sell their friends.

The plan has the tremendous advantage to the Ford company of centralizing responsibility for enrollments. Under

### All "Dangerous Cars" to Be Banned

CONCORD, N. H., Aug. 30.—In an effort to reduce accidents upon the New Hampshire highways the state officials in charge of motor registrations have notified their inspectors to check up upon cars now being operated in that state, which are not safe to be on the roads.

In case of an accident if it is found that the vehicle is so old that it is a menace the registration is to be revoked and owner may consign it to the junk heap, for it will not be permitted on the highways.

the original plan it was difficult to keep up a steady enrollment effort as this was entirely in dealers' hands and dealers had many other things to do. Formerly each dealer had to follow-up each enrollment when payments fell behind, being notified from the banks where individual weekly payment accounts were kept.

#### One Bank Account

Under the new plan each bank keeps only one account; that with Motor Buyers. All payments are credited to this account. The bank simply forwards stubs from the regular payment books to Motor Buyers, which keeps all the individual accounts. Motor Buyers keeps the account up to date if it is at all possible, assuming practically all the responsibility in this respect except where it feels a dealer may be interested in certain phases in his own personal accounts.

With the plan operating on a national scale, the finance company is of the opinion that it is possible to keep the factory from two to five months ahead of orders. It has been working on the plan for a considerable period and it was introduced at the recent annual convention of Ford branch managers, when it was determined to try it out first in the Detroit district. The plan has the complete indorsement of the Ford company and received its first public announcement this week.

The book used under the plan is called "Ford Buyers' Coupon Book." It is about the size of a pocket check book and contains 40 coupons and stubs, each representing a \$5 payment. Essentially it is for the accumulation of a down payment on any Ford model rather than for accumulating a complete purchase price. They are sold for the first payment of \$5 either by the dealer or his salesman, or by the finance company or its salesmen.

The buyer of a book is immediately enrolled under the payment plan. The first payment is receipted for on the first

(Continued on Page 41.)

### Say Rail Motor Coach Plan on Kowloon-Canton Is Successful

#### Only Difficulty in Operation, Asserts Report, Is Delay in Parts Replacements

WASHINGTON, Sept. 1.—Rail motor coaches of American manufacture, in operation on the British section of the Kowloon-Canton railway since 1922 have proved a success, Consul Leroy Weber at Hongkong recently advised the Department of Commerce. He says while this equipment, according to the railway officials, is in the experimental stage, these cars have rendered good service at an economic cost, fulfill the requirements for a light train, for working up new traffic and for development and emergency purposes. The only difficulty encountered in operation has been the delay in securing spare parts and replacements. This, he confides, should be easily remedied.

The introduction of rail motor cars on the railways of South Australia likewise proved so successful, according to Consul H. H. Balch, Adelaide, that all the states of Australia may adopt this type of passenger vehicle for feeder and short lines in less populous territory. The first 2 of 12 cars ordered from an American company have already arrived and have been installed after successful trial trips. It is said that the chief commissioner of railways plans to purchase about 100 additional rail motor cars for passenger service on the South Australian lines during the next two or three years.

The New South Wales government is experimenting with rail motor cars built in its own shops, but it is understood that the cost is much greater than that of the American cars. The Tasmanian government also has the matter under consideration.

#### WRONG FIRM STYLE

BOSTON, Sept. 1.—The Universal Auto Cover Co. is the style of the firm that has succeeded the Auto Spring Protector Co. in Boston. In Motor Age of Aug. 21, it was erroneously stated that the new style would be the Auto Spring Protector Co. The Universal Auto Cover Co. manufactures "Universal" Auto Spring Protectors, having its factory and office at 330 Newberry street, Boston.

#### BIG TIRE LOCK MARKET

PHILADELPHIA, Aug. 29.—A survey made in a number of cities covering more than 5,000 cars equipped with spare tires showed that less than 50 per cent were equipped with locks for the spares. This survey was made by an advertising agency for the Miller Lock Co. It shows the enormous market for the sale of tire carrier locks.



## State Rescinds Many Licenses for Drunkenness; Thirty-Six Denied Privilege for Five Years

**HARTFORD, Conn., Sept. 1.**—In the State of Connecticut the drunken driver menace is assuming broad proportions. More than 1,500 drivers now are under suspension for driving while under the influence of liquor. In the first half of the year, 369 licenses were suspended because of this offense and 63 of the operators involved were sentenced to jail.

Thirty-six drivers have been deprived of the right to drive a car in Connecticut for a period of five years. This means they have been twice convicted on an intoxication charge. Approximately 600 of the others have been under suspension for more than a year.

The number of suspensions reached a peak last year when 733 drivers were ordered off the road because of driving while under the influence of liquor. The number suspended this year up to the present time is larger than the entire end year of 1922.

## Ford Tries New Method in Sale of Weekly Pay Plan

(Continued from Page 40.)

payment stub and the coupon and money mailed to Motor Buyers. The remaining thirty-nine payments may be made in any bank. Weekly payments are urged—otherwise as frequently as possible. In every case the smallest payment must be \$5 as each coupon is for that amount. The books are each numbered separately and all records are kept entirely by number.

Where the sale has been through the finance company the buyer may select any dealer he prefers. He simply presents his book in either case to the dealer, is credited with the amount set forth as a down payment, arranges for his remaining payments, and receives his car.

### Facilitates Approach

To the Ford dealer and salesman, the most important part of the new plan, probably, is that the book gives him a much easier approach to prospective enrollments. There is no effort required whatsoever, Motor Buyers indicates, to approach any person at any time, present the book and declare that they are seeking to sell the prospect a Ford car under this payment plan. The book itself will get the interest of the buyer and hold it long enough to let the salesman make his talk.

House to house canvassing is brought to its most practicable possibilities under the plan, it is held. Salesmen may go from door to door and with the book get attention upon the plan that otherwise would be impossible. Plans for pushing the enrollments provide for presenting the books at all forms of contact that a salesman may have—picnics, barber shops, restaurants, street cars, or any place that people may congregate.

Continued interest of book holders in their car buying undertaking is sought through the use of slogans on the back of each coupon page.

Nationalization of the plan awaits the success of the plant in its Detroit try-

out and, that being successful, the consent of the Ford Motor Co. to its extension to other localities, and the consent of dealers and bankers to cooperate. Some changes may have to be made following its trial here but if it is nationalized it will be substantially as outlined above.

### Can Expand Swiftly

Plans of Motor Buyers, Inc., are such that it can speedily open branch offices in all cities in which Ford branches are located. The work of acquainting dealers and banks can be accomplished quickly and with their cooperation the plan can be set in motion within a short time. At the present time practically all Ford dealers in this district are cooperating and the others are rapidly coming in. Bankers like the revised plan better than the former.

Motor Buyers, Inc., is a new organization in name only. It was formerly Motor Finance Corp., the president of which is Alonzo P. Ewing. The change in title has been made because the company is departing from the mere detail of financing car sales to selling and operating a financing service. C. C. Winningham is the originator of the plan, with Mr. Ewing, all details of which are copyrighted under their names. The company formerly handled Ford paper exclusively and the new plan is a result of experience in this work. It will of course continue to finance Ford sales to owners, the weekly payment plan being a service in connection with it.

### EXCHANGE BUSINESS GOOD

**GREENFIELD, Mass., Sept. 1.**—The Franklin County Automobile Dealers Exchange, of Garfield, Mass., which opened July 1 with Dean H. Lake, formerly with the Pond Co., Studebaker distributors in Honolulu, as manager, reports a very successful business for the month of July. Sales were 40 cars with a stock of 52 cars on hand, some of which were taken from dealers who had them on hand previous to the opening of the Exchange. This Exchange is operated on the Noyes-New London plan.

## Upward of 780,000,000 Feet of Lumber Used in Bodies in '23

Probably 200,000,000 Feet Also  
Went Into Crating Material  
for Year's Shippings

**WASHINGTON, Aug. 31.**—Automobile body construction alone in 1923 accounted for a total consumption of 780,000,000 to 800,000,000 feet of lumber, the National Lumber Manufacturers Association recently estimated. It is recorded that the lumber required for the body of an open passenger car is 150 feet; for a small sedan, 225 feet, and for a large closed car, 325 feet.

It is further estimated that for crating and shipping, both in domestic and export trade, a large amount of lumber is used; probably over 200,000,000 feet in 1923. Ash is considered a desirable wood because of its moderate weight in proportion to strength; its high degree of toughness, comparative freedom from warping and easy workability. Ash is being used now mostly for the heavier bodies of the higher priced cars.

For body construction the Forest Products Laboratory estimates 29 per cent of lumber used is maple; 27 per cent is elm; 15.5 per cent is ash; 10 per cent is oak; 8 per cent is gum; 6.5 per cent is birch; 1.4 per cent is softwood pine, hemlock, and 2.6 per cent is other species.

## Tire Business Better, Reports Segar in Half Year Review

**NEW YORK, Sept. 1.**—"The tire business of the company has shown a very substantial improvement, and, in spite of materially lower prices, the results for the first six months have more than justified the hope expressed in the annual report for last year. The outlook for a continuance of this improvement is very encouraging," says C. B. Seger, chairman of the board of the United States Rubber Co., reporting to his stockholders on operations for the first half of the year.

Mr. Seger states that the company's sales of rubber products in the period amounted to \$77,774,696, a decrease of \$9,935,509 compared with the corresponding period of last year, due in part to lower selling prices but principally to general business conditions. Net income before interest, but after charges, amounted to \$7,510,415; interest on the funded debt to \$2,360,200 and all other interest \$727,728, a total of \$3,087,928, leaving net profits of \$4,422,487 for the period. This compares with \$4,572,861 for the first six months of 1923.

### REPRESENT BIFLEX

**WAUKEGAN, Ill., Sept. 1.**—Announcement is made that the Green, Fulton, Cunningham Co. has been engaged as the advertising agency for the Biflex Corporation, of Waukegan. The arrangement became effective Aug. 7.



## With the Associations

### Big Day for Garage Owners

CHICAGO, Sept. 7.—The Chicago Garage Owners Association held its 15th annual outing and basket picnic at Foss Park, North Chicago, on Aug. 28. It was generally pronounced one of the most successful events of the kind that the organization has ever staged. More than ordinary care was taken to provide a program that would appeal to both sexes and all ages as guests included members of families and friends.

There was a baseball game, swimming, dancing, races, tennis and other interesting features, including an automobile parade and numerous contests, prizes for which were largely items strictly automotive that are donated to the annual event by different factors of the trade. There also were cash prizes. Exhibition classical dancing by a troupe of talented performers gave a number of novel interpretations.

The picnic committee was composed of the following: President and chairman, Charles F. Burrows, R. A. Goudie, N. R. Farwell, J. G. Thompson, and R. Kohn.

Robert Bland, association manager served as director of events.

### A. E. A. Show Drawing Sept. 25

CHICAGO, Sept. 1.—Public drawing for space allotments at the show to be staged in connection with the annual convention of the Automotive Equipment Association Nov. 10-15 will be held by the Show Committee at Congress Hotel, Chicago, on Sept. 25, beginning at 10:30 a. m. Show exhibitors are assured better accommodations than formerly in view of the fact that the new addition to the Coliseum, where the event is to be staged, will be available. This, it is pointed out at A. E. A. headquarters, will eliminate the necessity of balcony booths, making it possible for all exhibitors to display their wares on the main floor. It should also facilitate general inspection of the exhibits by those attending the show.

### Accept Applications

CHICAGO, Sept. 1.—The National Standard Parts Association reports the

acceptance of application for membership of 22 jobbers and 19 manufacturers. C. B. Fraser, secretary of the association states that the work of organization is proceeding satisfactorily and that interest evidenced promises the successful launching of the permanent organization in the fall. The association has headquarters at 2204 South Michigan avenue, Chicago.

### Fair Chiefs Back Down

COLUMBUS, O., Sept. 1.—After trying for several weeks to sell space in the usual automobile building, managers of the Ohio State Fair which was held in Columbus August 25, turned the automobile show management over to the Columbus Automobile Dealers' Co. The fair managers had believed it could give the show on its own hook.

Practically all makes of cars represented in Columbus were shown. A. B. Coates, was the manager as usual. C. F. Moyer is president of the Columbus Automobile Dealers' Co.

## Coming Motor Events

### Automobile Shows

Chicago.....Jan. 24-31, 1925  
National Automobile Chamber of Commerce.

Chicago.....Oct. 11-18  
Second Annual Closed Car Show, Coliseum, under the auspices of the Chicago Automobile Trade Association. L. L. Fest in charge.

Chicago.....Oct. 21-27  
First National Transportation Show in American Exposition Building, promoted by Motor Truck Industries, Inc. William Hallanger, Manager.

Chicago.....Jan. 26-31  
Twentieth Annual Automobile Salon.

Clarksburg, W. Va.....Oct. 16-18  
Clarksburg Automotive Trade Association Closed Car Show, Carmichael Auditorium.

Dallas, Texas.....Oct. 11-26  
Annual Automobile Show, Fair Grounds, under the auspices of the Dallas Automotive Trades Association.

Detroit.....Jan. 17-24, 1925  
Detroit Automobile Show, Detroit Dealers' Association.

El Paso, Texas.....Sept. 20-27  
Automobile Show, Exposition Grounds, under the auspices of the Automobile Department of the International Fair Association. W. J. Wile and E. C. Heid, General Chairmen.

Indianapolis.....Sept. 1-6  
Annual Fall Automobile and Accessory Show, in conjunction with Indiana State Fair, Automobile Building, Fair Grounds. William Jones, Manager.

Kansas City, Mo.....Feb. 7-14, 1925  
Kansas City Motor Car Dealers' Association Show.

Newark, N. J.....Jan. 10-17, 1925  
Eighteenth Annual Automobile Show under the auspices of the New Jersey Automobile Exhibition Co., Chamber of Commerce Building. Claude E. Holgate, Manager.

New York.....Nov. 9-15  
Twentieth Annual Automobile Salon, Hotel Commodore.

New York.....Jan. 3-10, 1925  
National Automobile Chamber of Commerce.

Philadelphia.....Jan. 10-17, 1925  
Twenty-fourth Annual Automobile Show, Philadelphia Automobile Trade Association, Commercial Museum.

Sacramento, Cal.....Sept. 1-10  
State Agricultural Society. C. E. Paine, Manager.

Toronto, Ont.....Aug. 23-Sept. 6  
Canadian Automotive Equipment Association and the Automotive Industries of Canada. Gib Robertson, Secretary.

### Foreign Shows

Berlin.....Sept. 26-Oct. 5

Paris, France.....Oct. 2-12  
Passenger Car and Accessory Show.

London, England.....Oct. 16-25

### Conventions

Akron, Ohio.....Nov. 18-20  
Annual Convention of the National Tire Dealers Association.

Atlantic City.....Oct. 14-17  
Thirteenth Annual Convention National Hardware Association of the United States, Marlborough-Blenheim Hotel.

Chicago.....Nov. 10-15  
Annual convention and show, Automotive Equipment Association.

Chicago.....Jan. 26-29, 1925  
Eighth Annual Convention, N. A. D. A., Hotel LaSalle.

Cleveland, O.....Oct. 15-17  
Fall convention Motor and Accessory Manufacturers' Association.

Cleveland.....Nov. 18-19  
Joint Service Meeting of the Society of Automotive Engineers and the National Automobile Chamber of Commerce.

Columbus, O.....Dec. 10-11  
Ohio Automotive Trade Association's annual convention.

Detroit.....Oct. 22-24  
S. A. E. Production Meeting and Exhibition.

Detroit.....January  
Annual Meeting of the Society of Automotive Engineers.

New York City.....Jan. 7, 1925  
New York Show, Convention N. A. D. A., Hotel Commodore.

White Sulphur Springs, W. Va., Sept. 17-20  
Annual Meeting of the Automotive Electric Association, Greenbrier Hotel.

Wilkes-Barre, Pa.....Oct. 17-18  
Fourth Annual Convention of the Pennsylvania Automotive Association, Hotel Stirling.

### Races

Fresno, Cal.....Oct. 4  
Fresno Speedway Association—150 miles.

Kansas City, Mo.....Oct. 19  
Kansas City Speedway Association—250 miles.

Los Angeles, Cal.....Nov. 29  
Los Angeles Speedway Association—250 miles.

Milan, Italy.....Sept. 7  
Monza Track—Italian Grand Prix.

Readville, Mass.....Sept. 6  
Short races—Jack Le Cain, Promoter.

Syracuse, N. Y.....Sept. 13  
Horace P. Murphy—100 miles.



# SQUEEKS & RATTLES

ACCORDING to reports an American motoring in the Far East was wrecked when his car smashed into a herd of wild asses. Well, we'll lay a little odds that the Far East does not boast of any of that species which are half as wild as some we have on our own highways.

Newspaper headline: "AUTOMOBILE WRECKERS GO OUT OF BUSINESS."

That surely can't mean all of them!

## That Noble Spirit

The two sixes had hit head-on and the respective owners were sadly inspecting the ruins in the ditch as they nursed their numerous bruises.

"I am very sorry, sir," said the first. "It was all my fault. I was simply reckless, and I stand ready to buy you a new car."

"Indeed you will not," protested the other. "It was my fault. I'm always taking chances. I must insist on buying you a new car."

Which is all right except as to the headline over the foregoing. It should be changed to read, "OUR BEST LIE."

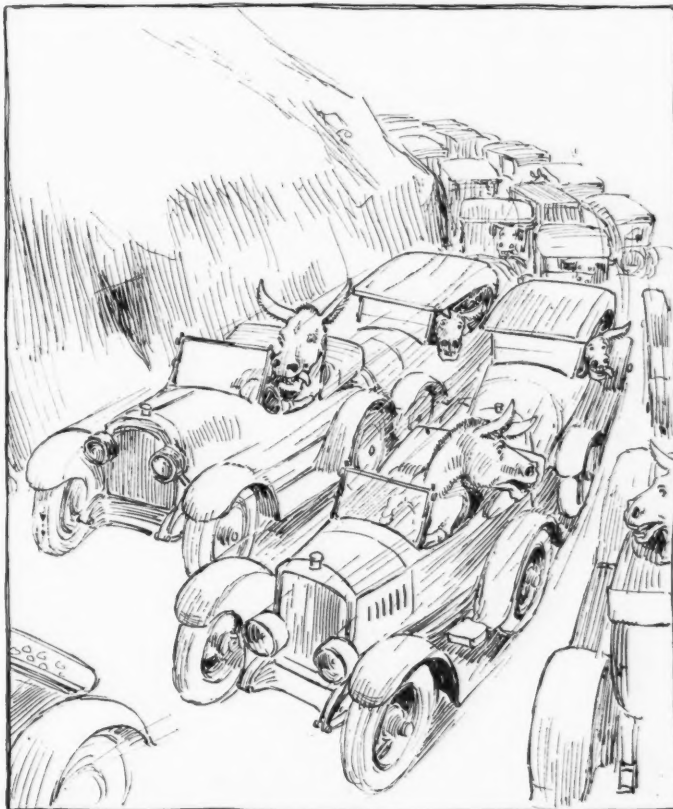
We have never heard ghosts in hot argument, but if ghosts do argue violently we imagine it is mostly over who was really entitled to the right-of-way.

## To Non-Members

Roads are choked with motor masses,  
Some with sense and some wild asses;  
However, none, admitting he  
Is of the Nut Fraternity;  
Now, if you think you don't belong  
Within that mad, riotous throng,  
Be glad you're not a flying jinny,  
Who's taking chances like a ninny;  
Let the asses have the passes,  
Make your pace like thick molasses,  
For he who goes like the old dray  
Will live to go another day.

The British artist who asserts that American girls are characteristically knock-kneed possibly suggests an explanation for many motor mysteries. After all, fellows, it might not always be the engine.

## Some You Have Met



## A Near Neighbor

"Workin' in a garage, hey Bill?"

"Yep, I'm a washer."

"A washer? Haw, haw! That means you're next to a nut."

"Well, at this particular moment I can't deny that, either."

Everybody can't be a big cog in the machinery, but anybody can be a wrench.

Scientists tell us that Greenland takes spells at shifting its position. Now you understand why the two American flyers considered themselves so lucky in making a successful hop from Iceland—and you grasp, let us hope, an explanation as to how the Italian aviator happened to miss Greenland entirely and flop into the water.

An owner says castor oil made his engine cut up. Who could blame it?



# Prices and Weights of Current Passenger Car Models

Ship.	Wt.	Pass.	Body Style	Price	Ship.	Wt.	Pass.	Body Style	Price	Ship.	Wt.	Pass.	Body Style	Price	Ship.	Wt.	Pass.	Body Style	Price
AMERICAN					CHEVROLET					DUESENBERG					HAYNES				
"D-66"					"Superior"					St. "8"					"60"				
2985	2-p		Roadster	\$1,950	1690	2-p		Sup. Roadster	\$495	3200	2-p		Roadster	\$6,500	3295	5-p		Touring	\$1,600
3175	4-p		Sp. Roadster	2,050	1790	5-p		Sup. Touring	510	3550	5-p		Phaeton	6,250	3590	5-p		Sedan	2,300
3260	5-p		Touring	1,695	1955	5-p		Phaeton DeLuxe	640	3750	7-p		Phaeton	6,750	3560	5-p		Brougham 4 d.	2,200
3300	5-p		Sport	1,850	2005	4-p		Sup. Coupe	725	3750	4-p		Sp. Phaeton	6,500	HUDSON				
3310	7-p		Touring	1,760	1880	2-p		Sup. Utility Coupe	640	4000	4-p		Coupe	7,500	"Super Six"				
3190	4-p		Sp. Touring	1,885	2070	5-p		Sup. Sedan	795	4350	7-p		Sedan	7,800	3300	4-p		Speedster	\$1,400
3470	7-p		Sedan	2,550	CHANDLER					DU PONT					3425	7-p		Phaeton	1,500
3310	5-p		Brougham	2,195	SS					"C"					3450	5-p		Coach	1,500
ANDERSON					2945	2-p		Roadster	\$1,795	3300	2-p		Roadster	\$2,090	3675	7-p		Sedan	2,250
2650	5-p		Touring	\$1,195	3130	4-p		Roadster	1,785	3400	5-p		Touring	2,090	HUPMOBILE				
2675	4-p		Sp. Touring	1,445	3160	5-p		Touring	1,585	3600	5-p		Touring Sedan	3,050	"R"				
2925	2-p		Coupe	1,425	3218	7-p		Touring	1,735	3600	5-p		Suburban Sedan	3,050	2595	2-p		Roadster	\$1,200
2725	4-p		Coach	1,495	3250	4-p		Royal Dispatch	1,885	2235	2-p		Roadster	\$1,040	2705	5-p		Touring	1,200
2875	5-p		Sedan	1,695	3380	5-p		Chummy Sedan	1,845	2325	5-p		Touring	890	2760	2-p		Coupe	1,440
2925	5-p		Sp. Sedan	1,895		5-p		Sedan	1,995	2345	5-p		Touring F.W.B.	940	2860	4-p		Coupe	1,595
			Brougham 3 d.	1,595	3600	7-p		Sedan	2,195	2395	5-p		Sp. Touring	1,090	2975	5-p		Sedan	1,775
2975	7-p		Touring	1,595	3480	7-p		Limousine	3,095	2495	5-p		Coupe	1,340	2875	5-p		Club Sedan	1,450
3200	7-p		Sedan	1,945	CHRYSLER					2405	2-p		Business Coupe	1,035	JEWETT				
APPERSON					2620	4-p		Roadster	\$1,625	2605	5-p		Sedan	1,365	2690	5-p		Touring	1,135
2915	5-p		Phaeton	\$1,395	2570	5-p		Touring	1,395	2770	5-p		Touring Sedan	1,465	2810	5-p		DeLuxe Touring	1,290
2965	5-p		Sp. Phaeton	1,600	2600	5-p		Phaeton	1,495	2550	5-p		Coach	1,185		3-p		Bus. Coupe	1,310
3400	5-p		Sedan	1,995	2800	5-p		Sedan	1,725	ELCAR					2880	5-p		Sedan	1,545
3450	5-p		Sp. Sedan	2,195	2915	5-p		Imperial Sedan	1,995	2560	5-p		"4-40-41"		3095	5-p		DeLuxe Sedan	1,745
			"g"		2855	5-p		Brougham	1,895	2585	5-p		Touring	\$995	2775	5-p		Brougham	1,385
4100	5-p		Phaeton	\$2,485	CLEVELAND					2900	5-p		Sedan	1,495	2829	5-p		Sp. Brougham	1,525
4315	7-p		Phaeton	2,535	2750	5-p		Touring	1,095	2641	5-p		Sportster	1,195	JORDAN				
4250	5-p		Sport Phaeton	2,900	2810	5-p		Touring De Luxe	1,195	2981	5-p		Sedan	1,495	(120 in. W. B.)				
4440	5-p		Sedan	3,485	2830	3-p		Coupe	1,295	2779	5-p		Brougham 3 d.	1,265	3000	2-p		Playboy Road.	\$1,850
4570	5-p		Sport Sedan	3,750	2930	5-p		Sedan 2-door	1,395	2829	5-p		Sp. Brougham 3 d.	1,395	3100	5-p		Touring	1,775
4555	7-p		Sedan	3,585	3040	5-p		Spec. Sedan 4 d.	1,495	2600	5-p		Demi Sp. Tour.	\$1,220	3420	5-p		Brougham 4 d.	2,385
AUBURN					COLE MASTER					2007	5-p		Touring	\$1,585	3375	4-p		Victoria	2,985
2550	5-p		Touring	\$1,095	3695	4-p		Volante Touring	\$2,325	2690	5-p		Sp. Touring	1,420	(124 in. W. B.)				
2672	5-p		Special Touring	1,395	3765	7-p		West. Tour.	2,325	2900	5-p		Sedan	1,720	3260	4-p		Blueboy Touring	2,095
2772	5-p		Sp. Touring	1,465	3695	4-p		Aero-Vol-Tour.	2,475	2981	5-p		Sp. Sedan	1,920	3585	5-p		Sedan	2,585
2850	5-p		Coupe Touring	1,695	3950	5-p		Brouette Sedan	3,225	2779	5-p		Brougham	1,490	Series "A"				
2852	5-p		English Coach	1,945	4090	7-p		Royal Sedan	3,225	2829	5-p		Sp. Brougham	1,620	3000	2-p		Playboy Road.	2,575
2932	5-p		Sedan	1,795	4150	7-p		Royal Limousine	3,325	2007	5-p		Touring	\$1,585	3100	5-p		Touring	2,575
			"6-63"		COLUMBIA					3380	5-p		Sedan	2,245	3420	5-p		Brougham	2,875
3262	5-p		Touring	1,795	2480	5-p		Roadster	1,775	3675	5-p		Sp. Sedan	2,395	3375	4-p		Victoria	2,775
3332	5-p		Sp. Touring	2,035	2485	5-p		Spec. Touring	1,275	3380	4-p		Brougham	1,995	3585	5-p		Sedan	2,975
3562	5-p		Sedan	2,545	2510	2-p		Coupe	1,375	3380	4-p		Brougham	1,995	(120 in. W. B.)				
3572	5-p		Brougham	2,345	2725	5-p		Coach	1,575	3380	4-p		Brougham	1,995	3428	2-p		Sportster	\$1,895
3572	7-p		Sedan	2,545	2810	5-p		Sedan	1,775	3380	4-p		Brougham	1,995	3428	4-p		Foursome	1,595
BARLEY					CUNNINGHAM					2130	5-p		Touring	\$900	3528	5-p		Touring	1,595
2750	5-p		Touring	\$1,395	"V-4"					2305	5-p		Coach	1,000	3645	3-p		Coupe	2,200
2800	5-p		Sp. Touring	1,495	4600	7-p		Touring	\$6,300	FLINT	3-p		Sp. Roadster	\$1,630	3875	5-p		Sedan	2,400
3100	5-p		Sedan	1,850	4500	4-p		Sp. Touring	5,800	8000	3-p		Sp. Roadster	\$1,630	3875	7-p		Sedan	2,425
3150	5-p		Sp. Sedan	2,250	4700	4-p		Coupe	7,150	3200	4-p		Coupe	2,095	3400	7-p		Road King Sedan	1,795
BUICK					5000	6-p		Sedan	7,650	3575	4-p		Sedan	2,185	3400	5-p		Road King Sedan	1,495
2750	2-p		Roadster	\$1,150	DAGMAR					2130	5-p		Touring	\$900	3400	5-p		Sedanette	1,995
2800	2-p		Roadster Encl.	1,190	3800	4-p		Sp. Touring	\$3,500	2305	5-p		Coach	1,000	3428	2-p		Sportster	\$1,995
2920	5-p		Phaeton	1,175	4200	4-p		Sedan	4,500	FLINT	3-p		Sp. Roadster	\$1,630	3428	4-p		Foursome	1,795
2970	5-p		Phaeton Encl.	1,250	4500	4-p		Sp. Touring	5,800	8000	3-p		Sp. Roadster	\$1,630	3528	7-p		Touring	1,795
3075	4-p		Coupe	1,565	4700	4-p		Coupe	7,150	3200	4-p		Coupe	2,095	3645	4-p		Coupe	2,400
3185	5-p		Dbl. Service Sedan	1,475	5000	6-p		Sedan	7,650	3575	4-p		Sedan	2,185	3875	7-p		Sedan	2,425
3245	5-p		Regular Sedan	1,665	DANIELS					2130	5-p		Touring	\$900	3400	7-p		Road King Sedan	1,795
			"Master		4600	7-p		Touring	\$6,300	2305	5-p		Coach	1,000	3400	5-p		Sedanette	2,395
3300	2-p		(120 in. W. B.)		4500	4-p		Sp. Touring	5,800	FLINT	3-p		Sp. Roadster	\$1,630	3428	2-p		Sportster	\$1,995
3455	5-p		Roadster Encl.	1,400	5000	6-p		Sedan	7,650	8000	3-p		Sp. Roadster	\$1,630	3428	4-p		Foursome	1,795
3455	5-p		Phaeton	1,395	DAGMAR					2130	5-p		Touring	\$900	3528	7-p		Touring	1,795
3675	4-p		Phaeton Encl.	1,475	3800	4-p		Sp. Touring	\$3,500	3200	4-p		Coupe	2,095	3645	4-p		Coupe	2,400
3675	4-p		Coupe	2,125	4200	4-p		Sedan	4,500	3575	4-p		Sedan	2,185	3875	7-p		Sedan	2,425
3845	5-p		Sedan	2,225	DANIELS					2130	5-p		Touring	\$900	3400	7-p		Road King Sedan	1,795
			(128 in. W. B.)		4600	7-p		Touring	\$6,300	2305	5-p		Coach	1,000	3400	5-p		Sedanette	2,395
3470	3-p		Sp. Roadster	\$1,750	4500	4-p		Sp. Touring	5,800	FLINT	3-p		Sp. Roadster	\$1,630	3428	2-p		Sportster	\$1,995
3605	5-p		Sp. Phaeton	1,800	4700	4-p		Coupe	7,150	8000	3-p		Sp. Roadster	\$1,630	3428	4-p		Foursome	1,795
3645	7-p		Phaeton	1,625	5000	6-p		Sedan	7,650	3200	4-p		Coupe	2,095	3528	7-p		Touring	1,795
3645	7-p		Phaeton Encl.	1,700	DAGMAR					2130	5-p		Touring	\$900	3645	4-p		Coupe	2,400
3940	3-p		Country Club	2,075	3800	4-p		Sp. Touring	\$3,500	3575	4-p		Sedan	2,185	3875	7-p		Sedan	2,425
4020	5-p		Brougham Sedan	2,350	4200	4-p		Sedan	4,500	2305	5-p		Coach	1,000	3400	7-p		Road King Sedan	1,795
4020	7-p		Sedan	2,425	DANIELS					2130	5-p		Touring	\$900	3400	5-p		Sedanette	2,395
4020	7-p		Sedan	2,425	4150	4-p		Touring	\$6,800	FLINT	3-p		Sp. Roadster	\$1,630	3428	2-p		Sportster	\$1,995
4020	7-p		Sedan	2,425	4765	7-p		Touring	6,900	8000	3-p		Sp. Roadster	\$1,630	3428	4-p		Foursome	1,795
4020	7-p		Sedan	2,425	4600	4-p		Sedan	7,600	3200	4-p		Coupe	2,095	3528	7-p		Touring	1,795
4020	7-p		Sedan	2,425	5200	7-p		Sedan	7,800	3575	4-p		Sedan	2,185	3645	4-p		Coupe	2,400
4020	7-p		Sedan	2,425	DAVIS					2130	5-p		Touring	\$900	3875	7-p		Sedan	2,425
4020	7-p		Sedan	2,425	2650	3-p		M. O'War Road.	\$1,495	23									



## Prices and Weights of Current Passenger Car Models

Ship.	Wt.	Pass.	Body Style	Price	Ship.	Wt.	Pass.	Body Style	Price	Ship.	Wt.	Pass.	Body Style	Price	Ship.	Wt.	Pass.	Body Style	Price
LOCOMOBILE					OLDSMOBILE					REVERE					STUTZ				
"48"					"30"					"M"					"KLDH"				
5030	4-p		Sportif Tour.	\$7,400	2145	2-p		Roadster	\$875	3700	2-p		Roadster	\$3,200	3600	3-p		Roadster	\$2,450
5330	5-p		Touring	7,400	2270	2-p		Sp. Roadster	985	3500	4-p		Speedster	3,200	3700	3-p		Sp. Roadster	2,765
5600	5-p		Victoria Sedan	9,990	2170	5-p		Touring	875	3800	5-p		Touring	3,200	3950	5-p		Sp. Touring	2,790
5464	7-p		Brougham	9,990	2320	5-p		Sp. Touring	1,015	4300	5-p		Sedan	4,000	4100	7-p		Touring	2,640
5640	7-p		Tour. Limousine	9,000	2295	2-p		Bus. Coupe	1,045	RICKENBACKER					4050	5-p		Touring	3,115
5685	7-p		Encl. Drive Lim.	9,990	2410	4-p		Coupe	1,175	"C"					4200	4-p		Coupe	2,990
5624	7-p		Cabriolet	10,250	2570	5-p		Sedan	1,250	2815	3-p		Sp. Roadster	\$1,645	4300	4-p		Sp. Coupe	3,250
McFARLAN					2700	5-p		DeLuxe Sedan	1,350	2880	5-p		Sp. Touring	1,595	"690-2"				
"6" TV					OVERLAND					"A"					3250	3-p		Roadster	\$1,995
4600	2-p		Roadster	\$5,400	"91" (100 in. wheelbase)					3050	4-p		Coupe	2,095	3750	5-p		Touring	1,995
4600	4-p		Sport Touring	5,600	1769	2-p		Roadster	\$495	3160	5-p		Sedan	2,195	"695"				
4700	7-p		Touring	5,700	1863	5-p		Touring	495	ROAMER					3900	5-p		Sportster	\$2,655
4900	4-p		Coupe	6,720	1918	5-p		Touring DeLuxe	560	"6-54-E" (118 in. W. B.)					3950	7-p		Touring	2,685
5200	4-p		Tour. Sedan	6,720	2177	2-p		Coupe	650	3100	2-p		Roadster	\$2,685	4150	5-p		Sedan	3,350
5200	7-p		Tour. Sedan	6,810	2130	5-p		Sedan	795	3100	4-p		Tourer	2,485	4350	7-p		Sedan	3,500
5200	7-p		Sp. Sedan	6,600	2004	5-p		Coupe Sedan	655	3300	4-p		Sp. Touring	2,750	4450	7-p		Berline	3,675
5200	7-p		Sub. Sedan	7,000	"92" (106 in. wheelbase)					4100	5-p		Spec. Sedan	\$4,250	TEMPLAR				
5100	7-p		Limousine	6,900	2047	5-p		Red Bird	\$695	4200	7-p		Suburban-Sedan	3,950	3300	4-p		Suburban Tour.	\$2,175
5200	7-p		"Light 6" SV	9,000	2044	5-p		Red Bird Spec.	735	"4-75-E"					3300	5-p		Phaeton	1,985
3700	3-p		Roadster	\$2,600	2090	5-p		Blue Bird	725	3650	4-p		Sport	3,650	3300	5-p		Sedan	2,785
3700	5-p		Touring	2,600	2004	5-p		Black Bird	695	"4-85-E"					3300	5-p		Brougham	2,650
3850	4-p		Coupe	3,100	2090	5-p		Black Bird Spec.	735	ROLLIN					2780	5-p		Touring	\$1,095
4850	5-p		Sedan	3,100	PACKARD					2300	5-p		Touring	\$995	3110	5-p		Sedan	1,595
MARMON					3165	4-p		Roadster	\$2,785	R & V KNIGHT					2780	5-p		Touring	1,275
"34"					3320	5-p		Touring	2,585	"H"					3780	5-p		Sp. Touring	1,565
3650	4-p		Speedster	\$3,295	3255	4-p		Sp. Touring	2,750	3840	4-p		Sp. Roadster	\$2,400	3000	5-p		Silver Swallow	1,645
3650	4-p		Speedster	3,295	3400	4-p		Coupe	3,275	3800	5-p		Touring	2,300	2895	5-p		DeLuxe Touring	1,495
3575	5-p		Phaeton	3,095	3515	5-p		Coupe	3,450	3850	7-p		Touring	2,375	2970	4-p		Coupe	1,845
3690	7-p		Phaeton	3,095	3565	5-p		Sedan	3,375	4050	5-p		Coupe	3,000	3455	5-p		Royal Sedan	1,895
3770	4-p		Coupe	3,585	3610	5-p		Sedan Limousine	3,425	4160	5-p		Club Sedan	3,050	3110	5-p		Sedan	1,895
3970	4-p		Sedan	3,985	"6" (126 in. W. B.)					4165	7-p		Sedan	3,250	3300	5-p		Touring Sedan	2,095
4155	7-p		Sedan	3,985	3430	7-p		Touring	\$2,785	ROLLS ROYCE					1945	5-p		Brougham 4 d.	1,945
4220	7-p		Suburban	4,285	3690	7-p		Sedan	3,625	Chassis—\$10,895. Prices of complete cars to be obtained from factory, Springfield, Mass.					WESTCOTT				
4100	7-p		Limousine	4,285	3765	7-p		Sedan Limousine	3,675	STANLEY					3050	5-p		Touring	\$1,690
4000	7-p		Town Car	4,285	"8" (136 in. W. B.)					4075	5-p		Sedan	3,585	3150	5-p		Spec. Touring	1,840
MAXWELL					3880	4-p		Runabout	3,850	4170	7-p		Sedan	3,985	3300	5-p		Brougham 4 d.	2,290
2135	2-p		Roadster	\$885	3990	5-p		Touring	3,650	STAR					3550	7-p		Touring	\$1,990
2230	5-p		Touring	895	3930	4-p		Sp. Touring	3,800	1700	2-p		Roadster	\$540	3650	7-p		Spec. Touring	2,190
2410	5-p		Sp. Touring	1,055	4125	4-p		Coupe	4,550	1790	5-p		Touring	540	"48"				
2280	2-p		Club Coupe	1,025	4200	5-p		Coupe	4,725	1880	5-p		Spec. Touring	640	3550	7-p		Touring	\$1,990
2480	5-p		Club Sedan	1,095	4270	5-p		Sedan	4,650	1980	2-p		Coupe	695	3650	7-p		Spec. Touring	2,190
2570	5-p		Sedan	1,325	4275	5-p		Sedan Limousine	4,700	2115	5-p		Sedan	785	"60"				
2785	5-p		Trav. Sedan	1,585	"8" (143 in. W. B.)					4350	7-p		Sedan Limousine	4,950	3300	5-p		Sedan	\$2,190
MOON					3677	4-p		Phaeton	\$1,895	STEARN'S-KNIGHT					WILLS SAINTE CLAIRE				
Series "A"					3742	7-p		Phaeton	1,895	"4"					"A-68" (121 in. W. B.)				
2400	4-p		Roadster	\$1,350	3880	4-p		Phaeton DeLuxe	2,095	3770	5-p		Phaeton	\$2,750	3240	3-p		Roadster	\$2,575
2410	4-p		Road. Spec.	1,150	4040	5-p		Sedan	2,595	3910	7-p		Phaeton	2,750	3320	5-p		Touring	2,475
2410	5-p		Sp. Touring	1,295	4128	7-p		Sedan	2,595	4075	5-p		Sedan	3,585	3460	4-p		Coupe	3,275
2625	5-p		Tour. Spec.	1,095	4300	7-p		Sub. Limousine	2,895	4170	7-p		Sedan	3,985	3420	7-p		Sedan	3,475
2625	5-p		Sedan 2 d.	1,595	4100	5-p		Sedan DeLuxe	2,770	"6"					3670	5-p		Imperial Sedan	3,575
2625	5-p		Sedan, 2 d Spec.	1,495	3900	5-p		Brougham 4 d.	2,175	3775	5-p		Touring	\$1,795	3500	5-p		Brougham	3,375
2750	5-p		Sedan 4 d.	1,695	4285	7-p		Sedan DeLuxe	2,770	4250	5-p		Sedan	2,095	3650	5-p		Limousine	3,850
2750	5-p		Sedan 4 d Spec.	1,595	PEERLESS					3750	5-p		Brougham	2,095	3600	5-p		Town Car	3,850
"6-40"					3050	2-p		Roadster	\$2,350	"4"					"B-68" (127 in. W. B.)				
2860	5-p		Touring	\$1,395	3175	5-p		Touring	2,285	3775	5-p		Coupe Roadster	\$1,795	3265	4-p		Roadster	\$2,875
2870	5-p		Sp. Touring	1,595	3175	5-p		Touring	2,485	3850	7-p		Touring	2,495	3335	5-p		Traveler	2,975
2920	4-p		Coupe	1,785	3550	5-p		Sedan	2,995	4025	2-p		Coupe	3,395	3500	7-p		Phaeton	2,875
2920	5-p		Sedan	1,795	3550	5-p		Coupe	2,950	4275	4-p		Sp. Coupe	3,150	3495	4-p		Coupe	3,675
3090	5-p		Petite Sedan	1,995	3550	5-p		Sedan	3,295	4275	7-p		Sp. Sedan	3,395	3625	5-p		Sedan	3,775
"6-50"					3980	4-p		Tour. Phaeton	\$2,690	4950	5-p		Brougham	3,200	3635	7-p		Sedan	3,800
2850	5-p		Touring	\$1,595	4130	4-p		Victoria Coupe	3,390	STERLING-KNIGHT					3570	5-p		Brougham 4-D	3,800
2970	5-p		Sp. Touring	1,695	PIERCE-ARROW					3200	4-p		Sp. Touring	\$2,250	3710	7-p		Limousine	3,990
3120	5-p		Sedan	1,985	4350	2-p		Runabout	\$5,250	3235	5-p		Phaeton	2,150	WILLIS-KNIGHT				
3190	5-p		Sp. Sedan	2,195	4590	5-p		Touring	5,250	3450	5-p		Sedan	2,800	"64"				
"6-58"					4830	4-p		Sedan	6,900	3450	4-p		Sp. Brougham	2,750	2681	2-p		Roadster	\$1,275
2720	5-p		Touring, Spec.	2,150	4830	4-p		Sedan	6,900	STEVENS-DURYEA					2768	5-p		Touring	1,295
3510	7-p		Sp. Touring	\$2,150	4960	7-p		Sedan	7,000	4200	2-p		Roadster	\$8,150	3062	3-p		Coupe	1,770
3510	7-p		Sedan	2,585	4730	4-p		Coupe Sedan	6,900	4400	7-p		Touring	7,500	3115	5-p		Sedan	1,795
3590	5-p		Petite Sedan	2,685	4730	6-p		Brougham	6,800	4250	4-p		Sp. Touring	7,750	3111	4-p		Coupe Sedan	1,550
3590	7-p		Petite Sedan	2,785	4850	7-p		Limousine	7,000	4600	4-p		Coupe	9,000	3115	5-p		Coupe Sedan	1,650
NASH					5060	7-p		Enclosed Lim.	7,000	4800	6-p		Sedan	9,675	3167	5-p		Sedan DeLuxe	1,995
"Special"					4780	7-p		French Lim.	7,000	4800	6-p		Town Brougham	10,175	"67"				
2960	5-p		Touring	\$1,095	4732	6-p		Landulet	7,000	4800	6-p		Vestibule Limou.	9,675	3059	7-p		Touring	1,425
3120	5-p		Sedan	1,295	"80"					3385	7-p		Phaeton	\$2,895	3431	7-p		Sedan	2,095
"Advanced"					3440	5-p		Sedan	3,895	"80"					3440	5-p		Sedan	3,895
(121 in. W. B.)					3625	7-p		Enc. Dr. Sedan	4,045	"80"					3625	7-p		Enc. Dr. Sedan	4,045
3370	3-p		Roadster	\$1,375	3360	4-p		Coupe	-----	"80"					3360	4-p		Coupe	-----
3250	5-p		Touring	1,375	PREMIER					3385	7-p		Phaeton	\$2,895	"6-D"				
3540	5-p		Sedan	1,695	3440	5-p		Sedan	3,895	3440	5-p		Sedan	3,895	3625	7-p		Sedan	3,995
"Advanced"					3625	7-p		Enc. Dr. Sedan	4,045	3625	7-p		Sedan	3,995	3675	7-p		Enc. Dr. Sedan	4,045
(127 in. W. B.)					3360	4-p		Coupe	-----	3675	7-p		Enc. Dr. Sedan	4,045	3360	4-p		Coupe	-----
3370	7-p		Touring	\$1,525	"T-C"					3172	5-p		Sta. Touring	\$1,395	"T-C"				
3670	7-p		Sedan	2,290	3182	5-p		Sport Touring	1,595	3182	5-p		Sport Touring	1,595	"T-C"				
3620	4-p		Coupe	2,190	3325	4-p		Coupe	1,875	3325	4-p		Coupe	1,875	"T-C"				
OAKLAND					3515	5-p		Sedan	1,985	3515	5-p		Sedan	1,985	"T-C"				
"6-54"					3695	5-p		Brougham 4 d.	2,235	3695	5-p		Brougham 4 d.	2,235	"T-C"				
2420	3-p		Roadster	\$1,095	"6-54"					3745	5-p		Speedster	\$1,835	"6-54"				
2510	3-p		Sp. Roadster	1,195	2420	3-p		Sp. Roadster	1,195	3630	7-p		Touring	1,750	"6-54"				
2485	5-p		Touring	1,095	2485	5-p		Touring	1,095	3770	5-p		Coupe	2,495	"6-54"				
2550	5-p		Sp. Touring	1,195	2550	5-p		Sp. Touring	1,195	4130	7-p		Sedan	2,685	"6-54"				
2620	3-p		Business Coupe	1,295	2620	3-p		Business Coupe	1,295	"6-54"					"6-54"				
2720	4-p		Coupe	1,495	2720	4-p		Coupe	1,495	"6-54"					"				

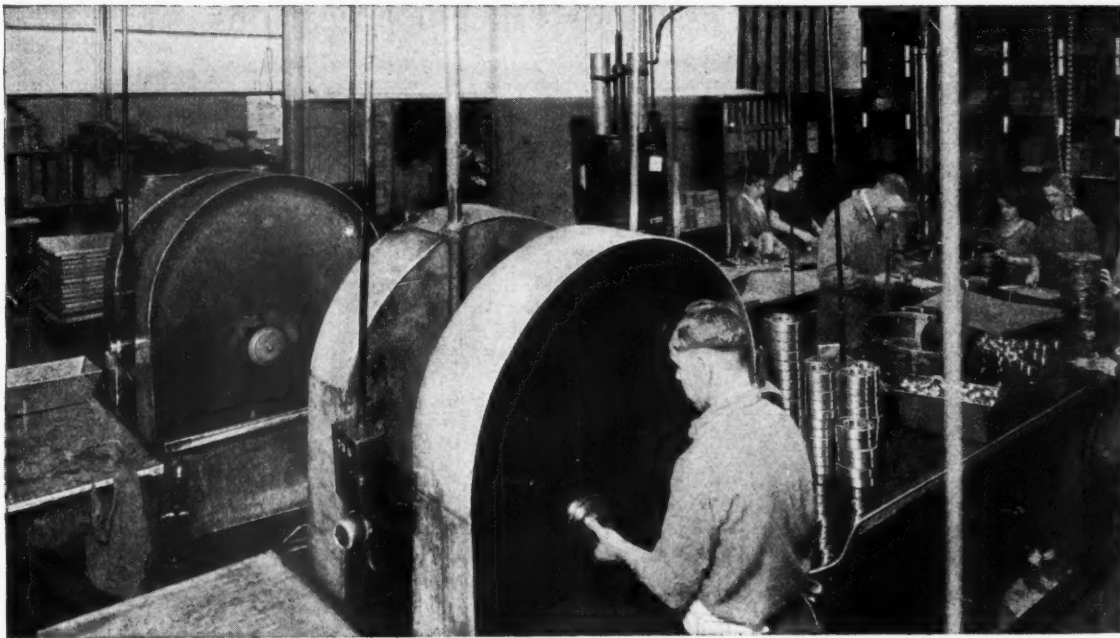


## Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

MAKE AND MODEL	Wheelbase (Ins.)	TIRES		ENGINE										Electrical System		Clutch	Gear-set	Universal Joints	REAR AXLE		BRAKES				Steering Gear	Rear Springs
		Standard Size (Ins.)†	Ballon Equipment	Make	Model	Number of Cylinders, Bore and Stroke (Ins.)	Rated Horsepower, N.A.C.C.	Valve Arrangement	Piston Material	Number of Main Crankshaft Bearings	Oiling System	Carburetor Make	Ignition System Make	Generator and Starter Make	Type and Make	Make	Type and Make	Type and Make	Gear Ratio‡	Foot, Type and Location	Hand, Type and Location	Four Wheel Brake Type	Make	Type and Length		
American D-66	127	33x4½	No	H-Sp	91	6-3½x5	29.40	L	C	3	PS	Str	A-K	G-D	P-B&B	War	M-Har	F-Sal	5.10	E-R	I-R	None	Lav	S-57½		
Anderson 41	115	32x4	Yes*	Cont	7U	6-3½x4½	23.44	L	C	4	PC	Zen	Wes	Wes	P-B&B	Dur	F-Thi	½ Sal	4.75	E-R	E-T	Mec*	Gem	S-58		
Anderson 50	122	32x4	Yes*	Cont	8R	6-3½x4½	27.34	L	C	4	PC	Zen	Rem	Rem	P-B&B	Dur	F-Thi	½ Sal	4.62	E-R	E-T	Mec*	Gem	S-58		
Apperson 6	120	32x4	Yes*	Fall	T8000	6-3½x4½	23.44	L	C	3	PS	Str	Rem	Rem	P-Roc	Mec	M-Thi	½ Col	5.10	E-R	I-R	Mec*	Lav	J-48		
Apperson 8	130	33x5	No	Own	8	8-3½x5	33.80	L	C	3	PS	Str	Rem	Rem	P-B&B	Wag	M-Thi	½ Own	4.25	E-R	I-R	Mec*	Own	J-48		
Auburn 6-43	114	31x4	Yes*	Cont	7U	6-3½x4½	23.44	L	C	4	PC	Str	Rem	Rem	P-B&B	War	M-Uni	½ Col	4.63	E-R	E-T	Mec*	Jac	S-57		
Auburn 6-63	122	32x4½	Yes*	Weid	Spec	6-3½x5	25.35	L	C	3	PC	Str	Rem	Rem	P-B&B	War	M-Thi	½ Col	4.63	E-R	E-T	Mec*	Ros	S-57		
Barley 6-51	118	32x4	No	Cont	7U	6-3½x4½	23.44	L	C	4	PC	Str	Del	De	P-B&B	Ful	R-M&E	½ Col	5.11	E-R	I-R	None	Jac	S-56		
Buick "Standard"	114½	31x4¾	Yes	Own	Sta	6-3 x4½	21.60	L	C	4	PC	Mar	Del	Del	D-Own	Own	M-Own	¾ Own	4.66	E-F	I-R	Mec	Jac	S-55½		
Buick "Master"	128	32x5¾	No	Own	6	6-3½x5½	27.34	L	C	4	PC	Mar	Del	Del	D-Own	Own	M-Own	¾ Own	4.70	E-F	I-R	Mec	Jac	V-46½		
Cadillac V-63	132	33x5	Yes*	Own	63	8-3½x5½	31.25	L	C	3	PC	Own	De	De	D-Own	Own	M-Spi	F-Own	4.50	B-F	I-R	Mec	Own	N-54		
Case JIC	122	32x4½	Yes	Cont	8R	6-3½x4½	27.34	L	C	4	PC	Sch	Del	Del	D-Own	Own	R-Sne	½ Col	4.90	E-R	I-R	Hyd*	Jac	S-44½		
Case Y	132	33x5	No	Cont	6T	6-3½x5	33.75	L	C	4	PC	Ray	Del	Del	D-Own	Own	R-Sne	¾ Col	4.40	E-R	I-R	None	Jac	S-57		
Chalmers Y	117	32x4	No	Own	6	6-3½x4½	25.35	L	A	3	PS	Str	A-L	A-L	P-Mec	War	M-Mec	½ Tim	5.13	E-R	I-R	Hyd*	Gem	S-56		
Chalmers Y	122	33x4½	No	Own	6	6-3½x4½	25.35	L	A	3	PS	Str	A-L	A-L	P-Mec	War	M-Mec	½ Tim	5.13	E-R	I-R	Hyd*	Gem	S-56		
Chandler SS	123	31x6 2	Yes	Own	6	6-3½x5	29.40	L	A	3	PC	Sch	Bos	Bos	P-B&B	Wag	M-The	F-Own	4.45	E-R	E-T	Mec*	Own	S-58½		
Chevrolet Superior	103	30x3½	No	Own	6	4-3½x4	21.76	L	C	3	PS	Zen	Rem	Rem	K-Own	Own	M-Own	½ Own	3.77	E-R	I-R	None	Own	Q-28		
Chrysler Six	112¾	30x5 7	Yes	Own	43	6-3 x4½	21.60	L	A	7	FP	Str	Rem	Rem	D-Own	Own	M-Own	½ Own	4.60	E-F	E-T	Hyd	Jax	S-51½		
Cleveland 43	115	31x5 2	Yes	Own	311	6-3½x4½	23.44	L	C	3	PC	Sch	Del	Del	P-B&B	W-G	R-Sne	½ Own	4.90	E-R	E-T	Mec*	CAS	S-53		
Cole Master	127¼	20x7 3	Yes*	Nort	7U	6-3½x4½	39.20	L	A	3	PC	Sch	Del	Del	D-Nor	Nor	M-Spi	F-Col	4.70	E-R	I-R	None	Gem	S-57		
Columbia 115	115	31x4	Yes*	Cont	6T	6-3½x4½	23.44	L	C	4	PC	Str	A-L	A-L	P-B&B	Dur	M-Spi	½ Tim	4.80	E-R	E-T	Hyd*	None	S-		
Crawford 6-73	138	33x4½	No	Cont	6T	6-3½x5½	31.54	L	C	4	PC	Zen	Wes	Bos	D-B-L	B-L	M-Spi	½ Tim	5.00	E-R	I-R	None	Lav	S-		
Cunningham V4	142	33x5	No	Own	V4	8-3½x5	45.00	L	C	3	FP	Str	Del	Del	D-Own	Own	R-Sne	F-Tim	4.23	E-R	I-R	None	Gem	J-62		
Dagmar 6-71	138	33x5	No	Cont	6T	6-3½x5½	31.54	L	C	4	PC	Zen	Wes	Bos	D-B-L	B-L	M-Spi	½ Tim	5.00	E-R	I-R	None	Lav	S-		
Daniels 24-38	138	33x5	Yes*	Own	24-38	8-3½x5½	39.20	L	C	3	PC	Zen	Del	Del	P-Own	Own	M-Spi	F Tim..	4.23	E-R	I-R	None	Gem	.....		
Davis 90	115	31x4	Yes*	Cont	7U	6-3½x4½	23.44	L	C	4	PC	Str	Del	Del	P-B&B	W-G	M-Pet	½ Tim	5.10	E-F	I-R	Hyd	Ros	S-52		
Davis 91	118	32x4½	Yes*	Cont	8R	6-3½x4½	27.34	L	C	4	PC	Str	Del	Del	P-B&B	W-G	M-Pet	½ Tim	5.10	E-F	I-R	Hyd	Ros	S-52		
Dodge Brothers 116	116	32x4	Yes*	Own	8	6-3½x4½	24.03	L	C	3	PS	Str	N-E	N-E	D-Own	Own	M-Own	¾ Own	4.54	E-R	I-R	None	Own	S-55		
Dort 27	115	31x4	Yes*	Fall	T8000	6-3½x4½	23.41	L	A	3	PC	Car	Bos	Bos	D-Dtl	Own	M-The	¾ Fli	4.66	E-R	I-R	None	None	V-50		
Duesenberg Straight 8	134	33x5	No	Own	8	8-2½x5	26.45	L	A	3	PS	Str	Del	Del	P-Own	Own	R-Chi	1 ½ Own	4.90	I-F	E-T	Hyd	Lav	S-50		
Dupont C	124	32x4½	No	H-Sp	90	6-3½x5	29.40	L	C	3	PS	Str	Wes	Wes	D-B-L	B-L	M-Spi	F Col	4.45	E-R	I-R	None	Jac	S-58		
Durant A-22	109	31x4	Yes*	Cont	Spec	4-3½x4½	24.03	L	A	3	PC	Til	A-L	A-L	P-Own	War	M-Spi	¾ Ad	4.33	E-R	I-R	Mec*	War	S-50½		
Elcar 6-41	112	31x4	Yes*	Lycro	CF	4-3½x5	21.03	L	A	5	PC	Zen	Del	A-L	P-B&B	W-G	M-Mec	½ Sal	4.70	E-R	I-R	Mec*	Ros	S-51		
Elcar 6-51	113	31x4	No	Cont	7U	6-3½x4½	23.44	L	C	4	PC	Str	Del	A-L	P-B&B	W-G	M-Mec	½ Sal	4.70	E-R	E-T	Mec*	Ros	E-51		
Elcar 6-61	118	32x4	Yes*	Cont	8R	6-3½x4½	27.34	L	C	4	PC	Str	Del	Del	P-B&B	W-G	M-Har	¾ Sal	4.70	E-R	I-R	Mec*	Ros	S-52		
Elcar 8-80	127	32x6 2	Yes	Lycro	8	8-3½x4½	31.25	L	C	5	PS	Str	Del	Del	P-B&B	W-G	M-Har	¾ Sal	4.70	E-R	I-R	Hyd	Ros	S-58		
Essex 6	110½	31x5 2	Yes	Own	6	6-2½x4½	17.32	L	A	3	Sp	Ste	Bos	Bos	D-Own	Own	M-Spi	½ Own	5.60	E-R	I-R	None	Own	S-54½		
Flint 40	115	30x5 2	Yes	Own	40	6-3½x4½	23.44	L	C	4	PC	Til	A-L	A-L	P	War	M-Spi	½ Ad	4.77	E-F	E-F	Mec*	War	S-50		
Flint 55	120	32x4½	Yes*	Cont	Spec	6-3½x5	27.34	L	C	7	PC	Str	DeJ	DeJ	P-Own	War	M-Spi	½ Ad	4.77	E-R	I-R	Mec*	War	S-54		
Ford T	100	30x3½	No	Own	T	4-3½x4	22.50	L	C	3	Sp	(Own)	Own	Own	D-Own	Own	M-Own	½ Own	3.63	E-T	I-R	None	None	O-43½		
Franklin 10 C	115	32x4 9	Yes*	Own	10-C	6-3½x4	25.35	L	A	7	PC	Str	A-K	A-K	P-M&E	Own	M-Spi	½ Own	4.73	E-T	E-R	None	Own	E-38		
Gardner Series 5	112	32x4	Yes*	Lycro	CE	4-3½x5	21.76	L	A	5	PC	Zen	Wes	Wes	P-Own	Own	M-Pet	¾ Tim	4.80	I-R	I-R	None	Ros	S-51		
Gray O	104	30x3½	Yes*	Own	R	4-3½x4	21.03	L	A	3	Sp	Sco	Wes	Wes	P-B&B	Mec	R-Sne	¾ Fli	3.90	I-R	I-R	None	Own	Q-30		
H.C.S. Series 4	120	32x4½	No	Weid	Spec	4-3½x5½	22.50	L	C	3	PS	Str	Del	Del	D-B-L	B-L	M-Spi	½ Own	4.63	I-R	I-R	None	Gem	S-56		
H.C.S. Series 6	126	32x5	Yes*	Own	60	6-3½x5	29.40	L	C	3	FP	Str	Del	Del	D-B-L	B-L	M-Spi	¾ Own	4.63	I-R	I-R	None	Gem	S-56		
Hatfield 6-35	121	32x4	No	H-Sp	40	6-3½x5	25.35	L	C	3	PS	Str	Bos	Bos	P-B&B	Dur	M-Spi	½ Col	4.63	E-R	I-R	None	Gem	S-58		
Haynes 6-60	121	33x5 7	Yes	Own	60	6-3½x4½	29.40	L	C	3	PS	Ray	Kin	L-N	D-Own	Mec	M-Thi	½ Own	4.41	E-R	E-T	None	Jac	S-54½		
Hudson Super 6	127	32x6 2	Yes	Own	6	6-3½x5	29.40	L	A	4	Sp	Ste	Bos	Bos	D-Own	Own	M-Spi	F Tim	4.45	E-R	I-R	None	Gem	S-58		
Hupmobile Series R	115	32x4	Yes*	Own	R	4-3½x5½	16.90	L	A	3	PC	Str	Wes	Wes	D-Own	Own	R-Uni	¾ Own	4.87	E-R	I-R	None	Ros	S-56½		
Jewett S	112	32x4 9	Yes	Own	6	6-3½x5	25.36	L	C	3	PC	Ray	A-K	Rem	D-Lon	War	M-Mec	½ Tim	4.45	E-R	E-T	None	Gem	S-54		
Jordan K&L	120	32x4	Yes*	Cont	Spec	6-3½x4½	26.34	L	C	4	PC	Str	Del	Del	P-Det	Det	M-Thi	½ Tim	4.45	E-F	I-R	Hyd	Gem	S-53½		
Jordan "A"	125½	32x6 2	Yes	Cont	Spec	8-3x4½	28.60	L	C	5	PC	Str	Bos	Bos	P-Det	Det	M-Thi	½ Tim	4.54	I-F	E-T	Hyd	Gem	S-53		

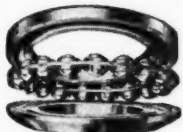




Double-acting thrust bearing, flat seats (grooved races) 2100-F Series



Single-acting thrust bearing, flat seats (grooved races) 1100-F Series



Single-acting, self-aligning thrust bearing 1100 Series



Single-acting, self-aligning thrust bearing, leveling washer, 1100-U Series



Double-acting, self-aligning thrust bearing, leveling washers 2100-U Series

## Strom Ball Bearings

*Are Protected from Dust and Moisture*

After a Strom Ball Bearing has been completed it is tested and inspected. Then it is again washed in a special cleaning compound. Finally dipped in hot rust-preventing grease and sealed in a moisture- and dust-proof wrapper.

From the time it receives its final cleansing to the time you open the sealed wrapper no hands touch it. So it comes to you in perfect condition, ready to use.

The same painstaking care marks every manufacturing step. Constant inspections insure the perfection of every

part. They are hardened throughout to give every part the hardness, elasticity and durability that mean long life.

The installation of Strom Ball Bearings is simple because they are interchangeable with other standard makes. And it means satisfied customers for you. For Strom Ball Bearings outlive the car or truck on which they are installed.

There is a Strom distributor near you. Phone him your needs. We promise you that he will give your order prompt and intelligent attention.



Single-row deep-groove Standard type, radial bearing



Double-row, deep-groove Standard type, radial bearing



Angular contact bearing, combination radial and thrust



Double-row, maximum type, radial bearing



Single-row, maximum type, radial bearing

# Strom

## BALL BEARINGS

STROM BALL BEARING MFG. CO.

Formerly U. S. Ball Bearing Mfg. Co.

4551 Palmer Street, Chicago, Ill.



## Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

MAKE AND MODEL	Wheelbase (Ins.)	TIRES		ENGINE										Electrical System		Clutch	Gear-set	Uni-versal Joints	REAR AXLE		BRAKES			Steering Gear	Rear Springs
		Standard Size (Ins.) <sup>+</sup>	Ballon Equipment	Make	Model	Number of Cylinders, Bore and Stroke (Ins.)	Rated Horsepower, N.A.C.C.	Valve Arrangement	Piston Material	Number of Main Crankshaft Bearings	Oiling System	Carburetor Make	Ignition System Make	Generator and Starter Make	Type and Make				Make	Type and Make	Type and Make	Gear Ratio <sup>+</sup>	Foot, Type and Location		
Paige.....70	131	33x4 1/2	Yes*	Cont	Spec	6-3 3/4x5	33.75	L	C	4	PC	Ray	A-K	Rem	D-Lon	W-G	M-Mec	1 1/2 Tim	4.90	E-R	I-R	None	Gem	S-61 1/2	
Peerless.....133	126	33x6.2	Yes*	Own	70	6-3 1/2x5	29.40	L	C	7	PC	Joh	Del	Del	D-Own	Own	M-Spi	1 1/2 Tim	4.66	E-F	I-R	Hyd	Gem	S-54	
Peerless.....66	128	33x5	Yes*	Own	66	8-3 1/4x5	33.80	L	C	3	PC	Bal	Del	Del	D-Own	Own	M-Spi	3/4 Tim	4.90	E-R	I-R	Hyd*	Gem	S-60	
Pierce-Arrow.....33	138	33x5	No	Own	33	6-4 x5 1/2	38.40	T	C	7	FP	Own	Del	Del	D-Own	Own	(M-Spi) (R-Goo)	1 1/2 Tim	4.29	E-R	I-R	Mec*	Gem	S-50	
Pierce-Arrow....."80"	130	32x5.7	Yes	Own	"80"	6-3 1/2x5	29.40	L	C	7	PC	Own	Del	Del	P-B&B	B-L	M-Spi	1 1/2 Tim	4.45	I-F	I-R	Mec	Gem	S-56 1/2	
Piercer.....6-D	126 1/2	32x4 1/2	Yes*	Own	6-D	6-3 3/8x5 1/2	27.34	L	A	3	PC	Str	Del	Del	P-B&B	Own	M-Blo	3/4 Col	4.70	E-R	I-R	Mec*	Gem	S-57 1/2	
R&V Knight.....11	124	32x4 1/2	No	Own	Kni	6-3 1/2x4 1/2	29.40	X	C	4	PC	Str	A-L	A-L	P-B-L	B-L	M-Spi	1 1/2 Tim	5.40	E-R	I-R	None	Jac	S-61	
Reo.....T6	120	32x6	Yes	Own	T6	6-3 1/2x5	24.34	X	C	4	PS	Sch	NE	NE	D-Own	Own	(M-Own) (R-Own)	1 1/2 Tim	4.70	E-R	I-R	None	Own	S-54 1/2	
Revere.....M	131	32x4 1/2	Yes*	Mons	4	4-4 3/8x6	30.63	II	A	2	PS	Str	Bos	Bos	D-B-L	B-L	M-Spi	3/4 Stn	3.44	E-R	I-R	None	Gem	S-58	
Rickenbacker.....C	117	32x4	Yes*	Own	C	6-3 1/2x4 3/4	23.44	L	C	3	PC	Str	Bos	Bos	D-Own	W-G	M-Mec	1 1/2 Tim	4.63	I-F	E-T	Mec	Gem	S-57	
Rickenbacker.....A	121 1/2	33x4 1/2	Yes*	Own	A	8-3 x4 1/2	28.60	L	C	9	PC	Zen	Bos	Del	M-Own	W-G	M-Mec	1 1/2 Tim	5.10	I-F	E-T	Mec	Gem	S-59	
Roamer.....6-54-E	118	32x4 1/2	No	Cont	12XD	6-3 1/2x5 1/2	29.40	L	A	3	PS	Str	Spl	Wes	P-B&B	Ful	R-M&E	3/4 Tim	4.60	E-R	I-R	Mec*	Jac	V-55 1/2	
Roamer.....4-75-F	126	32x4 1/2	No	Dues	G1	4-4 1/2x6	28.90	II	A	3	FP	Str	Bos	Wes	D-B-L	B-L	R-M&E	3/4 Tim	4.63	E-R	I-R	Mec*	Jac	V-55 1/2	
Rollin.....G	112	21x5 1/4	Yes	Own	G	4-3 1/4x4 1/2	16.90	L	A	4	PC	Til	Con	Dyn	P-B&B	Mun	R-Sne	1 1/2 Sal	5.10	E-F	E-F	Mec	Dit	O-46 1/2	
Rolls-Royce.....40-50	143 1/2	33x5	No	Own	40	6-4 1/2x4 3/4	48.60	L	A	7	FP	Own	Bos	Wes	K-Own	Own	M-Own	F Own	3.72	I-R	I-R	None	Own	V-54 1/2	
Stanley.....750	130	33x5.7	Yes	Own	750	2-4 x5	13.00	X	C	2	Non	Non	Bij	Non	P-Own	Non	Non	1 1/2 Own	4.50	E-R	I-R	None	.....	.....	
Star.....4	102	30x4.9	Yes*	Own	Spec	4-3 1/2x4 1/2	15.63	L	C	3	PS	TL	A-L	A-L	D-Own	War	M-Spi	3/4 Ad	4.87	E-R	I-R	Mec*	War	S-40 1/2	
Stearns-Knight.....SKL4	119	33x4 1/2	No	Own	Kni	4-3 1/2x5 1/2	22.50	X	C	4	PC	Sch	A-K	A-L	D-Own	Own	R-Cl	1 1/2 Own	4.50	E-R	I-R	Hyd*	Own	V-50	
Stearns-Knight.....6	130	33x5	No	Own	Kni	6-3 1/2x5	25.35	X	C	4	PC	Sch	A-K	A-L	D-Own	Own	R-Cl	1 1/2 Own	4.70	E-R	I-R	Hyd*	Own	V-50	
Sterling-Knight.....125	32x4 1/2	Yes*	Own	Kni	6-3 1/2x4 3/4	25.35	X	C	7	FP	Str	Wes	Bos	Bos	D-Ful	Ful	R-Cl	1 1/2 Tim	4.66	E-R	I-R	Mec*	Ros	S-58	
Stevens Duryea.....G	138	33x5	No	Own	G	6-4 1/8x5 1/2	47.25	L	C	4	PC	Str	Bos	Bos	D-B-L	B-L	M-Spi	F Tim	3.76	E-R	I-R	None	Ros	S-57 1/2	
Studebaker.....Light Six	112	31x4	Yes*	Own	EM	6-3 1/2x4 1/2	23.44	L	C	4	PS	Str	(Wag) (Rem)	(Wag) (Rem)	P-Own	Own	R-The	1 1/2 Tim	5.00	E-R	I-R	None	Own	S-50	
Studebaker.....Spec. Six	119	32x4	Yes*	Own	EL	6-3 1/2x5	29.40	L	C	4	PS	Str	(Wag) (Rem)	(Wag) (Rem)	P-Own	Own	M-Spi	1 1/2 Tim	4.33	E-R	I-R	None	Own	S-56	
Studebaker.....Big Six	126	33x4 1/2	Yes*	Own	EK	6-3 1/2x5	36.04	L	C	4	PS	Bal	(Wag) (Rem)	(Wag) (Rem)	P-Own	Own	M-Spi	1 1/2 Tim	3.71	E-R	I-R	None	Own	S-56	
Stutz.....690-2	120	32x4	Yes*	Own	691	6-3 1/2x5	29.40	I	C	3	PC	Str	Rem	Rem	P-B&B	W-G	M-Mec	1 1/2 Tim	5.10	E-R	I-R	None	Gem	61 1/2	
Stutz.....KLDH	130	32x4 1/2	No	Own	KLDH	4-4 1/2x6	30.63	T	C	3	PC	Str	Del	Rem	D-W-G	Own	M-Har	1 1/2 Tim	3.75	I-R	I-R	None	Gem	S-60	
Stutz.....695	130	32x4 1/2	Yes*	Own	691	6-3 1/2x5	29.40	I	C	3	PC	Str	Rem	Rem	P-B&B	W-G	M-Mec	1 1/2 Tim	4.66	E-R	I-R	Hyd*	Gem	S-61 1/2	
Templar.....122	33x4	No	Own	691	6-3 1/2x5	27.34	L	C	.....	PS	T1	Dyn	Dyn	Dyn	P-M&E	War	R-Sne	3/4 Sal	5.10	I-F	E-T	Mec	Ros	S-54	
Velie.....60	118	32x5.2	Yes*	Own	56	6-3 1/2x4 1/2	24.38	I	C	4	FP	Str	Wes	Wes	P-B&B	Dur	M-Thi	1 1/2 Tim	5.10	E-F	I-R	Hyd	Ros	S-55	
Westcott.....4	125	32x4 1/2	Yes*	Cont	12X	6-3 1/2x5 1/2	29.40	L	A	3	PS	Ray	Del	Del	P-B&B	B-L	M-Pet	1 1/2 Tim	4.45	E-R	I-R	Mec*	Gem	S-59	
Westcott.....44	120	32x4 1/2	Yes*	Cont	8R	6-3 1/2x4 1/2	27.34	L	C	4	PC	Str	Del	Del	P-B&B	War	M-Pet	1 1/2 Col	4.90	E-R	E-T	Mec*	Gem	S-57 1/2	
Westcott.....6	118	32x4	Yes*	Cont	8R	6-3 1/2x4 1/2	27.34	L	C	4	PC	Str	Del	Del	P-B&B	War	M-Pet	1 1/2 Col	4.63	E-R	E-T	Mec*	Gem	S-56	
Wills Ste. Claire.....A&B6	121	32x4 1/2	Yes*	Own	A68	8-3 1/4x4	33.80	I	C	3	FP	(Zen) (Sch)	De	Del	P-Own	Own	M-Spi	1 1/2 Eat	4.45	(E-R) (I-F)	(I-R) (I-R)	(None) (Hyd)	Own	(S-54) (S-58)	
Willis Knight.....64&6	118	33x4.9	Yes	Own	64	4-3 3/8x4 1/2	21.03	X	C	3	PS	Til	A-L	A-L	D-Own	Own	R-Own	1 1/2 Tim	4.44	E-R	I-R	None	Own	S-55	
Willis Knight.....124	124	33x5.7	Yes*	Own	64	4-3 1/2x4 1/2	21.03	X	C	3	PS	Til	A-L	A-L	D-Own	Own	R-Own	1 1/2 Tim	5.12	E-R	I-R	None	Own	S-55	
TAXICABS																									
Checker.....117	33x4 1/2	No	Buda	WTU	4-3 3/4x5 1/2	22.50	L	C	3	PC	Zen	Sci	Wes	Wes	D-Ful	Ful	Blo	3/4 Col	4.87	E-R	I-R	None	Jon	S-57 1/2	
Driggs.....108 1/2	30x3 1/2	No	Own	WTU	4-2 1/2x4 1/2	11.03	L	C	.....	PS	Zen	Bos	Bos	Bos	D-Ful	Ful	Spi	3/4 Own	4.74	E-R	I-R	None	Own	S-	
Elcar.....4	118	33x4 1/2	No	Lyc	CF	4-3 3/8x5	21.03	L	A	5	PC	Cur	A-L	A-L	P-B&B	Mun	Pet	3/4 Sal	4.75	E-R	I-R	None	CAS	S-51	
Elcar.....6	118	33x4 1/2	No	Cont	8R	6-3 1/2x4 1/2	27.34	L	C	4	PC	Str	Del	Del	P-B&B	War	Spi	3/4 Sal	4.75	E-R	I-R	None	Gem	S-52	
Kelsey.....E	112	32x4	No	Lyc	CH	4-3 1/2x5	19.60	L	A	5	PC	Zen	Bos	Bos	P-B&B	W-M	M-Spi	3/4 Sal	5.10	E-R	I-R	None	Lav	S-55	
Pennant.....115	33x4 1/2	No	Buda	WTU	4-3 3/4x5 1/2	22.50	L	B	3	PC	Zen	Bos	Bos	Wes	D-Ful	Ful	Blo	3/4 Col	4.87	E-R	I-R	None	Jon	S-57	
Pennant.....4A	118	33x4 1/2	No	Buda	WTU	4-3 3/4x5 1/2	22.50	L	B	3	PC	Zen	Bos	Bos	D-Ful	Ful	Blo	3/4 Col	4.70	E-R	I-R	None	Ros	S-57 1/2	
Rauch & Lang.....T	112	32x4	No	Buda	WTU	4-3 3/4x5 1/2	22.50	L	B	3	PC	Zen	Bos	Dyn†	P-Det	Det	Spi	1 1/2 Sta	5.10	E-R	E-T	None	Gem	S-50 1/2	
Rauch & Lang.....102	33x4 1/2	No	Own	T-6	Electric	6-3 1/2x5	24.30	G	A	4	PS	Sch	N-E	N-E	D-Own	None	Own	Own	8.60	.....	.....	None	None	S-	
Reo.....V	113	33x4 1/2	Yes*	Own	T-6	6-3 1/2x5	24.30	G	A	4	PS	Sch	N-E	N-E	D-Own	None	Own	Own	4.70	E-R	I-R	None	Own	S-55	
Traveler.....108 1/2	32x4	No	Buda	WTU	4-3 3/4x5 1/2	22.50	L	B	3	PC	Zen	Eis	Eis	Eis	B-L	W-M	Spi	Col	.....	E-R	I-R	None	Gem	S-	
White.....15A	119	34x4 1/2	No	Own	64	4-3 3/4x5 1/2	22.50	L	C	3	Sp	Zen	Opt	Opt	P-Own	Own	Own	1 1/2 Own	5.12	E-R	I-R	None	Own	J-	
Willis Knight.....A.B.C.	118	32x4 1/2	Yes*	Own	64	4-3 3/8x4 1/2	21.03	X	C	3	PS	Til	A-L	A-L	D-Own	Own	Own	3/4 Tim	5.12	E-R	I-R	None	Own	S-55	
Yellow.....O-4	109	32x4 1/2	No	Cont	V7	4-3 3/8x5	22.50	L	C	3	PC	Zen	Bos	N-E†	D-B-L	B-L	Spi	3/4 Tim	4.90	E-R	E-T	None	Gem	56	
Yellow.....A-2	109	29x4 1/2	Yes	Cont	V7	4-3 1/2x5	22.50	L	C	3	PC	Zen	Bos	N-E†	D-B-L	B-L	Spi	3/4 Tim	4.90	E-R	E-T	None	Gem	56	

## TAXICABS

## ABBREVIATIONS—

\*—Electric

†—Generator only

\*—At extra cost

†—On Phaeton models

A—Aluminum

Anst—Ansted

Ad—Adams

A-K—Atwater-Kent

A-L—Auto-Lite

B—Bentley

B-L—Ball &amp; Ball

B&amp;B—Borg &amp; Beck

B-F—Both Interiors

B-L—Brown-Lipe

Bos—Bosch

C—Cast Iron

Car—Carter

Chi—Climax

Col—Columbia

Con—Connecticut

Cont—Continental

D—Multiple Disk

Del—Delco

Det—Detroit

De J—De Jon

Dit—Ditwiler

Doo—Dooley

Dtl—Detlaff

Dues—Duesenberg

Dur—Durstun

Dyn—Dyneto

E—Full Elliptic

E-F—External Four Wheels

E-R—External Rear Wheels

E-T—External Transmission

Ent—Eaton

F—Full Floating

Fll—Falls

Flnt—Flint

FP—Full Pressure to all bearings including wrist pins

Ful—Fuller

1/2 F—Semi-Floating

3/4 F—Three-Quarter Floating

G—Head and Side

G-D—Gray &amp; Davis

Gem—Gemmer

G-L—Grant-Lees

Goo—Goodrich

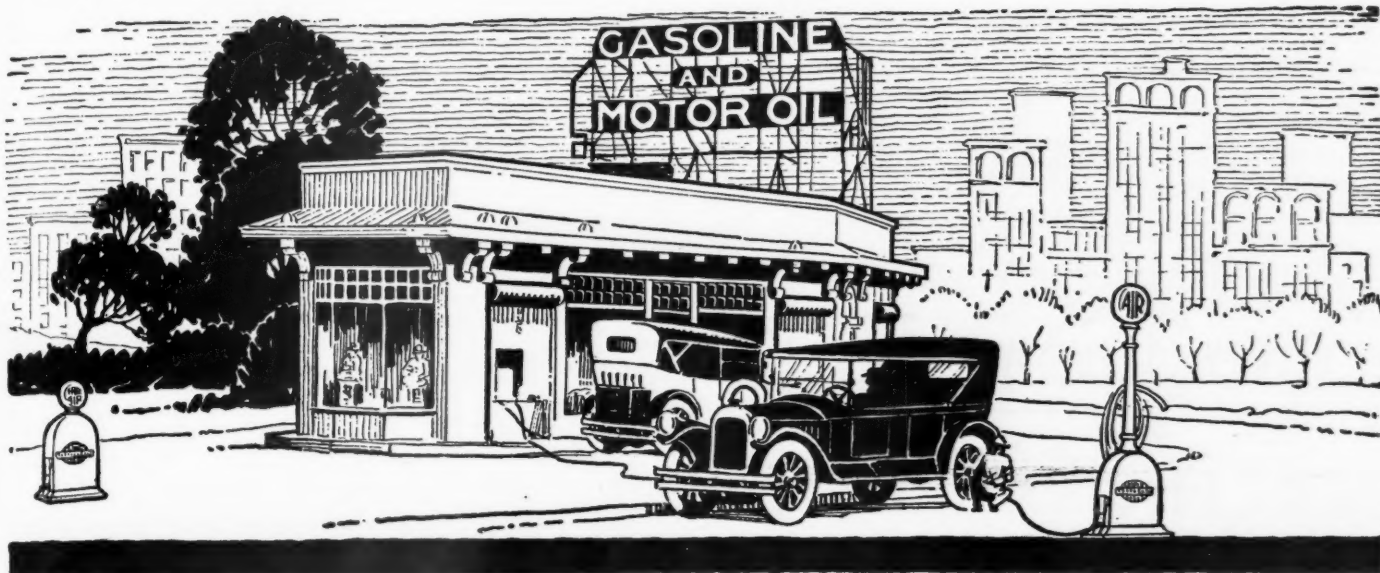
H—Horizontal

Har—Hart

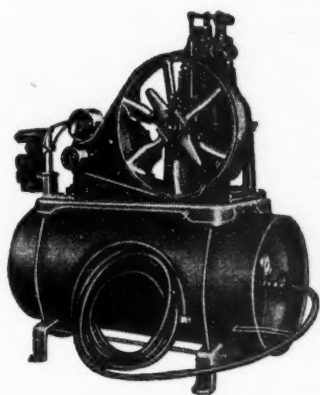
Hol—Holley

Hoo—Hoosier





## No Spitting of Oil When a Curtis Cuts Out



There are two sound reasons for this. First: The exclusive and patented controlled splash oiling system prevents an excess of oil from getting into the discharge line. Second: There is no bleeding discharge pipe or intermediate tank. Automatic starting and stopping device includes centrifugal unloader to relieve compressor of starting load.

## Many Styles and Sizes

We manufacture in our 17½ acre plant a complete line of single and two-stage air and water-cooled compressors, stationary and portable. They are original in design—embody many exclusive features that assure long life and minimum upkeep. There is a style, size and arrangement to suit your particular needs. Use coupon for full information.

## At Last, a Real Air Stand

After several years experimenting, the Curtis Air Stand is now available. It is free of all complicated parts—nothing to get out of order, its design and construction being quite a departure from the ordinary stand. It is made of metal and painted with rust-proof enamel paint in an attractive color. Comes with or without water connection—ready wired and all pipe connections arranged for easy attachment.

### Column Type or Low Type To Suit Your Particular Need

The Curtis has no oil checks, no counter weights, no clock spring to crystallize and break, no swaying trolley poles, no swinging hose that is dangerous



to persons standing nearby, or to glass windshields. Has hose outlet 4½" above curb line so there is no dragging of hose over fenders or hood. Hose is automatically stored on a drum. The tension to wind the drum is provided with a large, generously proportioned cylinder spring and will last a life time. Has positive stop to prevent hose being drawn out or wound in too far. When not being used the hose automatically winds itself up into the housing, thereby not being exposed to the elements.

**CURTIS PNEUMATIC MACHINERY CO.**  
1527 Kienlen Ave. St. Louis, U. S. A.

Branch Office  
530-H Hudson Terminal, New York City

# CURTIS

1854 <sup>70th</sup> ANNIVERSARY 1924

**CURTIS  
PNEUMATIC  
MACHINERY CO.**  
1527 Kienlen Ave.  
ST. LOUIS, MO.

Gentlemen:—Please send me full details on

- ☐ Curtis Compressors  
☐ Curtis Air Stands

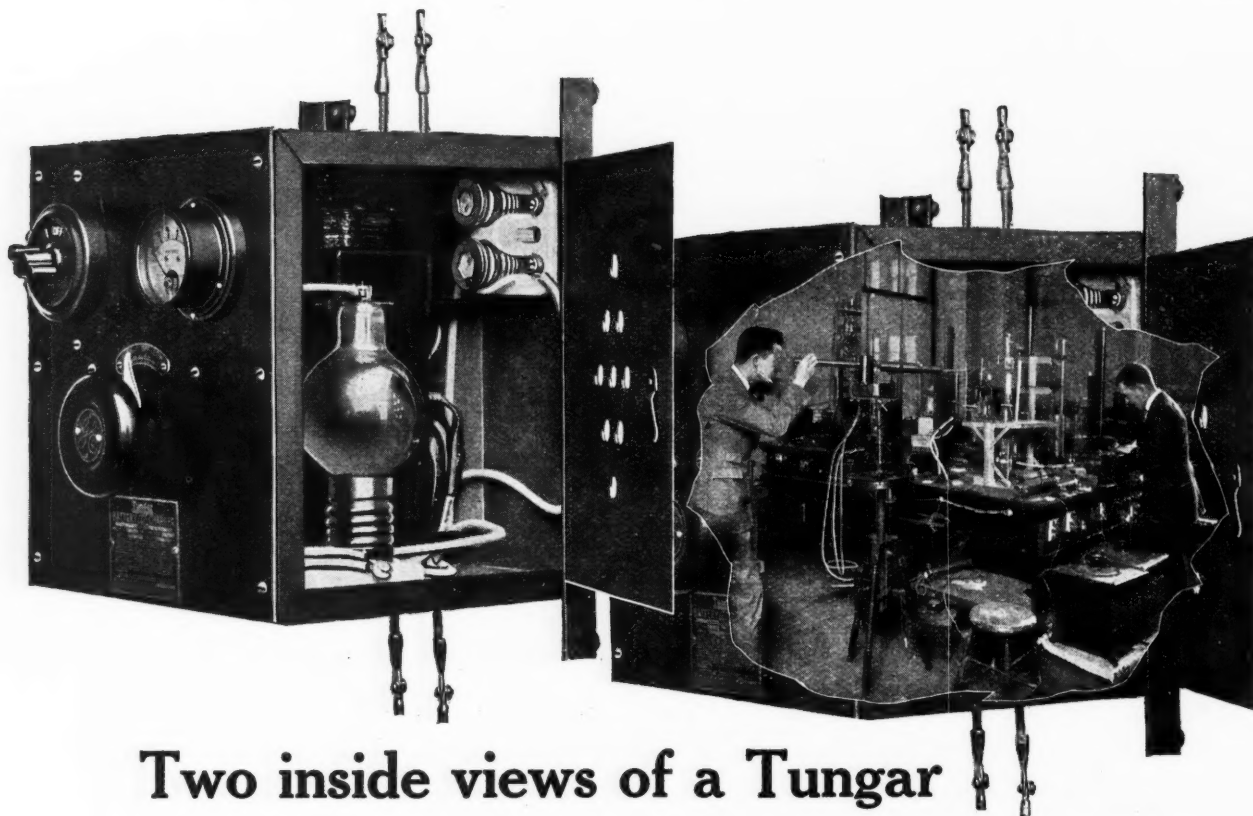
Name.....

Address.....

Jobber's Name.....

Address.....





## Two inside views of a Tungar

When purchasing battery charging equipment, consider Tungar from two points of view:

- 1—The high grade of tested material used in every part of its strong, dependable construction which insures carefree operation and long life.
- 2—The extensive study and experiment in the G-E Research Laboratories that have been placed behind its development in order to produce an instrument of great efficiency.

Tungar handles the radio and auto battery recharging business of the average size garage or service station with complete satisfaction and a good profit.



The  
Guarantee of Excellence  
on Goods Electrical

### G-E Constant Potential Battery Charging Equipment

The "swift service" system for larger stations. Charges the average battery in from 9 to 12 hours. For the station handling 20 batteries or more per day. Write for detailed information.

**HEAVY DUTY**  
**Tungar**  
REG. U.S. PAT. OFF.  
**BATTERY CHARGER**

*Tungar—a registered trade mark—is found only on the genuine. Look for it on the name plate*

MERCHANDISE DEPARTMENT

# GENERAL ELECTRIC

BRIDGEPORT, CONN.

48E-15



# New! *for* FORDS

## The Safest Automobile Lock Made

One push on the switch button does two things: Shuts off the ignition and automatically locks the car. No possibility of forgetting. No danger of theft because of carelessness. The car is always locked except when the engine is running. In this way the ELECTROLOCK successfully overcomes the greatest of all theft hazards—the forgetfulness or carelessness of the owner to use his lock.

For the first time danger-free, positive automatic theft protection has all been combined in one lock, at a reasonable price.

Carries the approval of the Underwriters' Laboratories and earns lowest theft insurance rate.

The ELECTROLOCK is sold only through Ford Dealers.

### MITCHELL SPECIALTY COMPANY

Philadelphia, Pa.

Manufacturers of automobile body hardware since 1914.

## Overcomes These 3 Big Hazards:

### Danger to Life and Property:

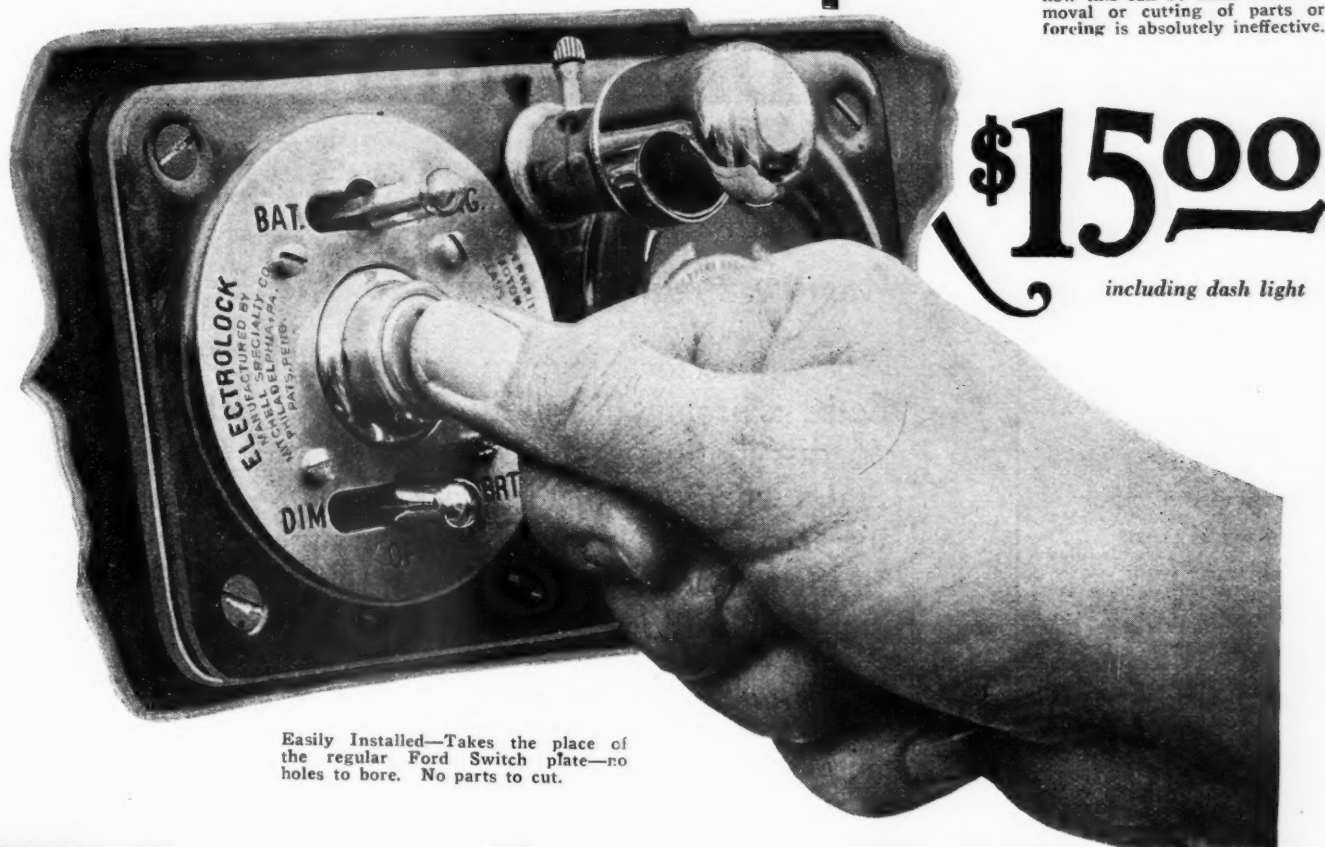
The ELECTROLOCK has no connection with steering gear or transmission and therefore cannot cause loss of control or accident if accidentally locked.

### The Forgetfulness of the Operator:

The ELECTROLOCK locks the car automatically the instant the ignition is shut off. In this way the real cause of most car losses—the owner forgetting to lock his car—is completely overcome.

### The Cunning of the Thief:

Is absolutely baffled by the ELECTROLOCK. It cannot be wired around—there is a standing offer of \$500 to the first person who can show us how this can be done. The removal or cutting of parts or forcing is absolutely ineffective.



Easily Installed—Takes the place of the regular Ford Switch plate—no holes to bore. No parts to cut.

# Electrolock

**YOU CAN'T FORGET TO LOCK IT!**





# Stocks and Distributing Points Throughout the United States

## DISTRIBUTING POINTS

ATLANTA, GA.  
176 Spring St.  
BOSTON, MASS.  
221 Columbus Ave.  
CHARLOTTE, N. C.  
205 W. 1st St.  
CHICAGO, ILL.  
2317 Calumet Ave.  
CLEVELAND, OHIO  
1276 W. 3rd St.  
DENVER, COLO.  
1310 Broadway  
DETROIT, MICH.  
2467 Grand River Ave.  
INDIANAPOLIS, IND.  
405 Guaranty Bldg.  
KANSAS CITY, MO.  
517 Palace Bldg.  
LOS ANGELES, CALIF.  
1425 So. Hope St.  
NEWARK, N. J.  
95 8th Ave.  
NEW YORK CITY  
27 Warren St.  
OMAHA, NEBR.  
10th St. Viaduct  
PHILADELPHIA, PA.  
235 S. 8th St.  
ROCHESTER, N. Y.  
116 St. Paul St.  
ST. PAUL, MINN.  
1547 University Ave.  
SAN FRANCISCO, CALIF.  
1066 Mission St.



Trade Mark

## Assure Prompt Service to the Trade

AN added advantage in selling TUNG-SOL bulbs, is prompt distributing service. There are 16 distributing points throughout the United States where complete stocks of TUNG-SOLS are carried. Jobbers, dealers, garagemen find in this service a great aid in meeting the constantly increasing demand for the Quality bulb.

*Automotive Merchants are Requested to  
Write for the Tung-Sol Proposition*

MINIATURE INCANDESCENT LAMP CORPORATION  
Newark, N. J.

*Licensed Under General Electric Company's Incandescent Lamp Patents.*

# TUNG-SOL

*"Let Tung-Sol Light the Way"*



# And Now!

# The New *Stewart*

# Triple-Bar Bumper

(All Steel)

100% Protection  
**PLUS**



100% Protection—PLUS. This Model 224 meets the popular demand for a triple-bar medium weight bumper, designed for light or heavy cars.

Note the wide bumping area. You can see what little chance there is of another car's bumper coming below or above this Stewart triple-bar model.

100% Protection—PLUS, for radiator, lamps and front or rear fenders. Put one of these triple-bar bumpers on display, place in your window the "catchy" posters we'll send you free, and increase fall sales with this new popular model.

No need to carry a big stock. You can always get quick delivery on bars or fitting sets from a nearby service station.

Tear off the coupon before you turn the page.

STEWART-WARNER SPEEDOMETER CORPORATION  
CHICAGO - U. S. A.

## Model 224

Bars—1  $\frac{1}{4}$  in. wide and  
 $\frac{3}{8}$  in. thick

\$25<sup>00</sup> (nickel  
finish)

\$22<sup>50</sup> (black  
finish)

\$3 additional West of  
100° Meridian

Other Models at Other  
Prices

Stewart Service  
Stations carry  
Your Stock—  
You carry the  
Samples



Mail in coupon for two of these snappy window posters and literature on Stewart Bumpers.

Stewart-Warner Speedometer Corporation  
1826 Diversey Parkway, Chicago

ADV. DEPT.

Please send me free bumper posters and literature.

(Print name and address plainly)

Name .....

Street .....

Town .....

State .....

Cars handled .....

100% Protection  
**PLUS**

# *Stewart*

CUSTOMBILT ACCESSORIES  
USED ON 9 MILLION CARS



# 18 successful years with PIERCE-ARROW



The Foss-Hughes Company of Philadelphia will shortly complete their nineteenth consecutive year as Pierce-Arrow representatives. They are the oldest dealers in their territory representing continuously one make of car. Their invested capital has grown until today it is *twenty-four times the original figure*.

This company never had a year during which they lost money. Their best year from the standpoint of net profits was 1923. During the past eighteen years their gross volume of business has been forty million dollars. The total number of new vehicles sold has been approximately 5,260.

\* \* \*

These are impressive facts. They emphasize how sound the Pierce-Arrow franchise has always been.

Today, for the Foss-Hughes Company and for every other Pierce-Arrow representative, the Pierce-Arrow franchise is more valuable than ever. Still greater opportunities are

assured by the introduction of the new Pierce-Arrow *Series 80*—more moderate in size and in price than the famous Dual-Valve Six. The price of the *Series 80* Seven-Passenger Touring car is \$2,895 at Buffalo.

With two types of passenger cars, a complete line of heavy duty motor trucks from 2-ton capacity upward, and a line of bus chassis that is conceded to be the leader in its field, the Pierce-Arrow dealer has a group of allied automotive products that smooths out the annual sales curve and practically eliminates "off seasons."

The services of the Pierce-Arrow Finance Corporation have greatly widened the market for Pierce-Arrow products, enabling customers to pay out of income rather than capital, if desired.

Correspondence is invited from dealers who are qualified to take advantage of the unusually sound opportunity presented by the Pierce-Arrow franchise.

THE PIERCE-ARROW MOTOR CAR COMPANY, *Buffalo, N. Y.*

Pierce-Arrow Products include passenger cars of two types: the Pierce-Arrow Dual-Valve Six and the Pierce-Arrow *Series 80* . . . Pierce-Arrow Motor Busses . . . Pierce-Arrow Heavy Duty Motor Trucks





## Are you driving a riveting machine or a motor?

**T**HAT harsh metallic hum in your timing gear case comes from a rapid succession of taps from worn metal gear teeth. It is like a small riveting machine operating in your motor.

When gears become worn they develop enough play to cause a sharp clink as the teeth come in contact. This produces a hum, roar, or snarl which is transmitted along sound-carrying metal throughout the motor.

### *How howling gears are hushed*

Celoron Silent Timing Gears properly mated with metal gears do away with metal-to-metal contact. Being resilient and non-metallic, they reduce wear, and gear teeth strike upon gear teeth without any noticeable sound.

Celoron Silent Timing Gears are dense, tough, durable. They absorb vibration, cushion shocks and lengthen the life of every unit of the timing train.

Stabilized Celoron is impervious to oil, grease, and water. It does not warp or swell, even at high motor temperatures. Manufacturers are rapidly awakening to the fact that Celoron

Silent Timing Gears permanently eliminate timing gear noise. There are now many popular makes of cars that are equipped at the factory with gears of Celoron.

### *In many popular cars*

Among the cars that have Celoron Silent Timing Gears as standard equipment are the following: Apperson, Courier, Dorris, Dort, Elcar, Gardner, Haynes (55), Marmon, Maxwell, Nash, Oldsmobile, and Rollin.

Celoron Silent Timing Gears can be used in any timing set. Gear blanks are both cut from sheet stock and molded. Teeth are cut in the regular hobbing machine. Service stations throughout the country are installing Celoron Gears in noisy motors.

Celoron is a laminated phenolic condensation material bonded with bakelite.

Celoron is made into silent timing gears for the replacement trade by Dalton and Balch. Jobbers and dealers carry stocks of these gears.

Look for the "Celoron" and "D & B" marks. They insure your getting a genuine Celoron Silent Timing Gear.

# CELORON SILENT GEARS

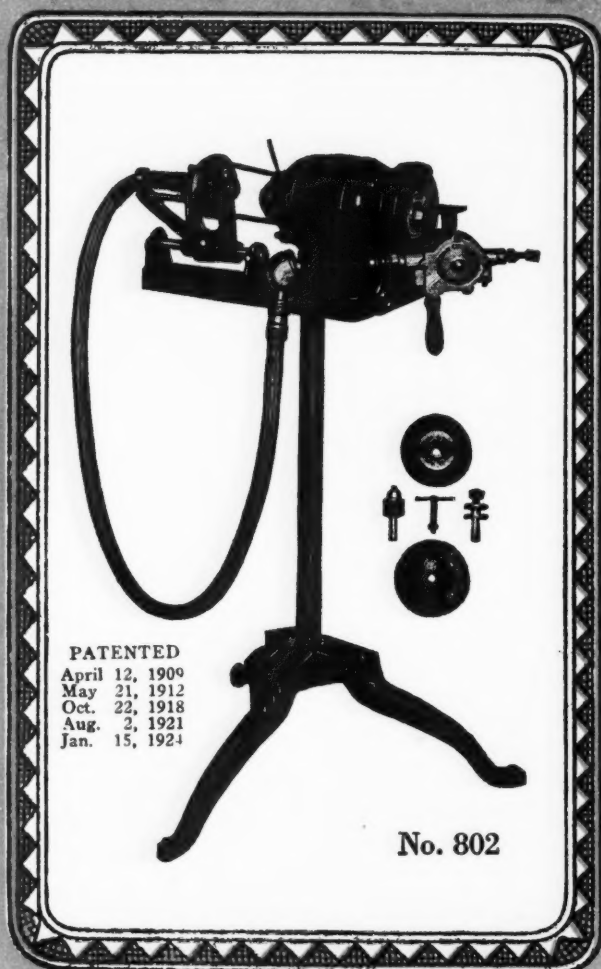
## Diamond State Fibre Company

Toronto, Canada

Bridgeport, Pennsylvania  
Branches in Principal Cities

London, England





## Save Time and Labor—Increase Profits

EVERY job of valve lapping, drilling, reaming, polishing, and carbon removing can be done *better*, quicker and at smaller labor cost, with the Sioux Flexible Shaft and Attachments. It takes the power to the job—exactly where you want it.

**For Valve Lapping**  
 it is especially handy and efficient. The 3-speed pulley provides the correct speed, low for large valves, higher for smaller valves. The clutch enables you stop and start at will.

**For Emery Wheel Grinding** you can take the emery wheel to the work and get in to otherwise inaccessible places. Especially handy in welding work for smoothing out the weld.

**Special Feature.** A 6 in. x ½ in. emery wheel—equipped with guard and tool rest—permanently attached to the motor for grinding tools and other small parts.

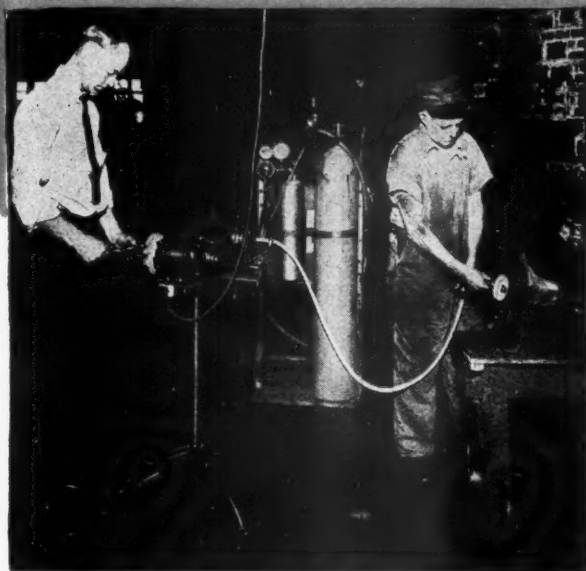
*Write For Full Information*

**ALBERTSON & CO., Sioux City, Ia.**

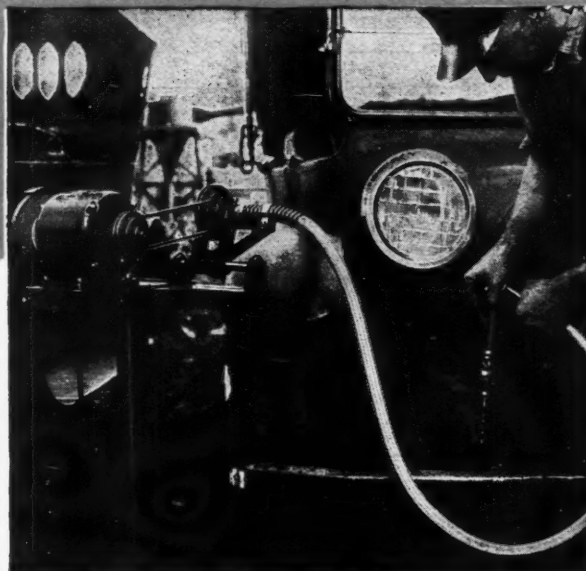
# Sioux Flexible Shaft.

*Sold By All Live Jobbers*





**For Emery Wheel Grinding**—this photo shows the Sioux in use for smoothing out welding work; also the emery wheel attached to the motor being used for grinding tools.



**For Drilling**—there are many jobs like this where the Sioux Flexible Shaft comes in mighty handy.



**For Carbon Removing**—the Sioux Flexible Shaft and Carbon Removing Brush saves lots of time and labor.

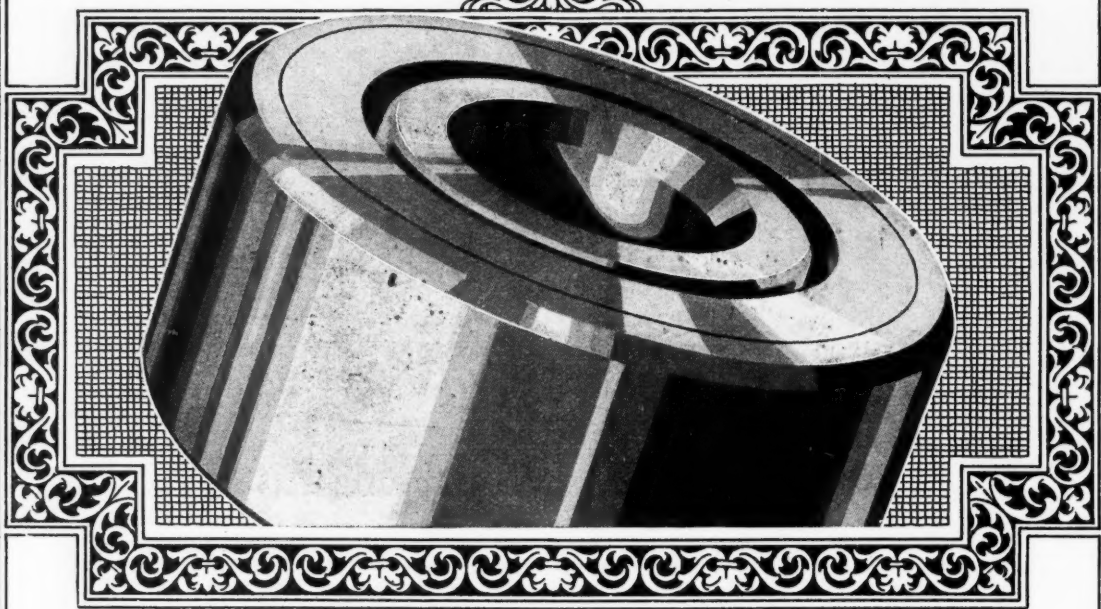


**Valve Lapping** is a quick job with the Sioux Flexible Shaft and Sioux Valve Grinder Attachment.

## and Attachments







# New Departure Ball Bearings

## *The Triple Function Bearing*

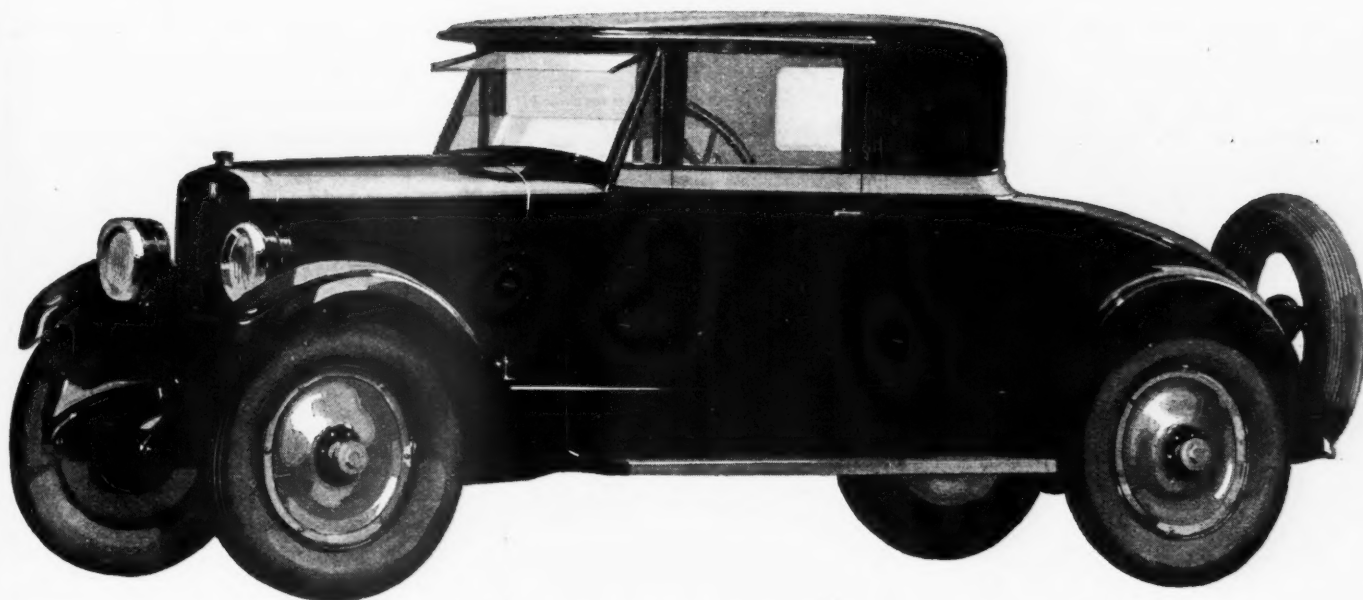
**B**EFORE the advent of the New Departure *Double Row* type it was customary to use a separate ball bearing for each load function. This meant that often *three* bearings were necessary to do the work for which the New Departure Double Row is now so often specified.

Other and less efficient bearing types than those employing balls can at best perform but two functions: support a radial and a *one* direction thrust load.

Wherever you would combine highest efficiency with the least cost and the least structural complication for supporting a combination of radial loads and thrust in *any* direction, specify the New Departure Double Row type.

THE NEW DEPARTURE MANUFACTURING CO.,  
Detroit                      BRISTOL, CONNECTICUT                      Chicago





The Rollin Coupe Roadster is one of the really smart cars of the season.

Its presence on your salesroom floor draws business. People come in to see it. It is the most talked about new design of the year. It takes ingenuity nowadays to get people in your store. This model does it — as no other model on all the market.

In addition you have all those features that make the Rollin the most advanced car of the year—

European Type Motor  
4-Bearing Crankshaft  
Aluminum Alloy Pistons  
and Connecting Rods  
New Carburetor and  
Manifold

Force-Feed Lubrication  
Balloon Tires  
4-Wheel Brakes  
25 to 30 miles per gallon  
of gasoline  
Transverse Rear Spring

We would like to take on a few more progressive dealers who know a ready seller when they see one.

Touring Car, \$995

Coupe Roadster, \$1195

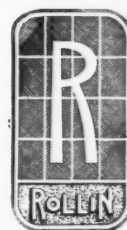
Sedan, \$1295

*Prices f. o. b. Cleveland. Tax extra.*

THE ROLLIN MOTORS COMPANY, CLEVELAND, OHIO, U. S. A.



ROLLIN





# 4 Reasons why the Jacobs Chuck is preferred



The Temco Electric Motor Co. of Leipsic, Ohio, is one of the 132 makers of drilling equipment who are letting the trade's preference be their guidance and using Jacobs Chucks as standard equipment.

## The 4 Reasons

1. The original Jacobs feature, the Tooth and Sleeved Key device, enables the operator to put a "slip-proof" grip on the drill without trouble.
2. Quickly "loaded." A drill may be slipped in a Jacobs Chuck and tightened "tight" in a jiffy.
3. Saves time. The Tooth and Sleeved Key Device saves much valuable time and insures greater accuracy.
4. Lasts longer. The Jacobs construction is of such quality that the chuck lasts longer than any other chuck made.

4 reasons why Jacobs Chucks are preferred by the industry—4 reasons why *you* should look for a Jacobs Chuck on the drill you buy.

THE JACOBS MFG COMPANY, HARTFORD, CONN.

*This advertisement inserted in the interest of better Service Equipment in general and the use of Portable Electric Drills in particular*



Brake Lining  
Rivet Holes  
*must* be right

Hard to hold her right on the dot on brake lining with a hand drill. Rivet Holes in brake lining can be drilled right and in no time with a portable electric drill. Holes in wood or metal, brake lining or any composition can be drilled *better* and *cheaper* with a good portable electric drill.

After all—the sole reason for buying an electric drill is to get *cheaper* and *more accurate* holes.

The chuck can "make or brake" the accuracy and speed of a drill. A chuck, constantly allowing the drill to slip, will not permit the boring of accurate holes and causes an expensive loss of time.

It is well to look at the chuck on the drill you buy, then—remember the trade's preference for Jacobs.



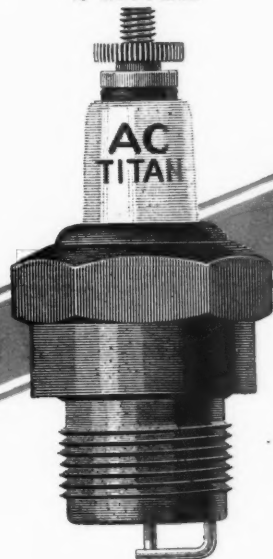
*"The World's Largest Producer of Drill Chucks"*



More than 85% of the American cars and trucks produced, Fords excluded, are AC-equipped

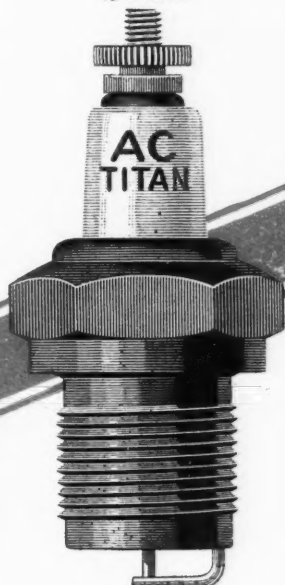
# The 6 Big-Selling Types of AC Spark Plugs

3/4" REGULAR



for  
\*Cadillac  
\*Flint Six  
\*Hupmobile  
\*Maxwell  
\*Star  
200 Others

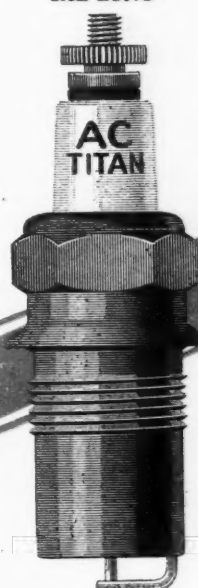
3/4" LONG



for  
\*Chevrolet  
\*Oakland  
\*Buick (to 1924)  
\*Kissel  
Stephens

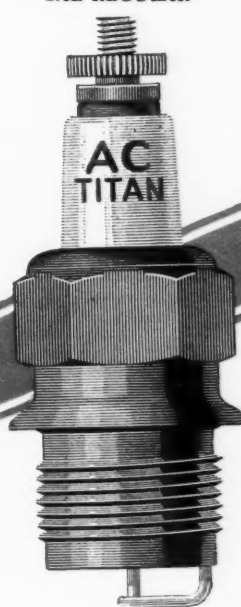
\*Factory Equipment  
\*With Carbon-proof Porcelain

SAE LONG



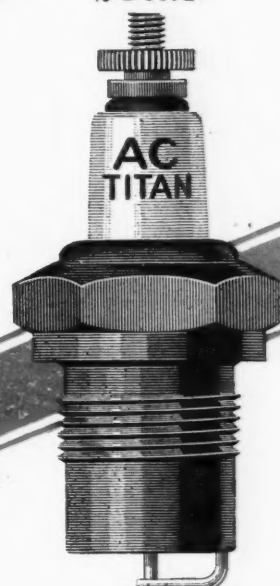
for  
\*Buick  
\*Nash Six  
\*Oldsmobile Six  
\*Durant Four  
\*Oakland (to 1924)

SAE REGULAR



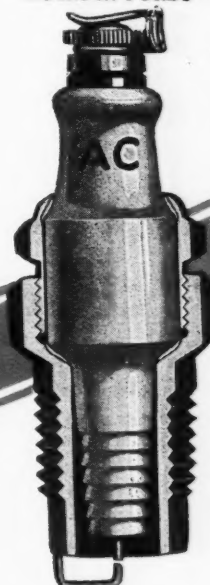
for  
\*Studebaker  
\*Durant Six  
\*Marmon  
\*Stearns-Knight  
Stutz

3/4" D TYPE



for  
\*Dodge Brothers  
\*Chandler  
\*Hanson  
\*Rickenbacker  
\*Westcott

AC 1075 for FORDS



## Features

- 1 Spring Terminal Clip
- 2 Heavy Body Porcelain
- 3 High Temperature Fins. Patented Carbon-proof Porcelain
- 4 Drip Electrode Forms Natural Oil Drain

**D**EALERS who have a good assortment of AC Spark Plugs can build a profitable business. The demand is assured as each type has its own following, due to car equipment.

AC-SPHINX  
Birmingham  
ENGLAND

AC Spark Plug Company, FLINT, Michigan

Makers of AC Spark Plugs—AC Speedometers

U. S. Pat. No. 1,135,727, April 13, 1915; U. S. Pat. No. 1,216,139, Feb. 13, 1917. Other Patents Pending

AC-OLEO  
Levallois-Perret  
FRANCE



# *Here It Is ~ the New* **LINCOLN**



*"Snubs  
The  
Rebound"*

**Designed — Engineered — Built  
Exclusively for Balloon Tire Users**

Lincoln Engineers, after exhaustive study of Balloon Tire performance, now present their specially designed Balloon Shock Absorber which has been perfected and tested step by step with the Balloon Tire itself.

It embodies a new principle and new automatic controls of the unusual action of Balloons. Continually varying tensions on a friction belt effectively counteracts all rebound and rocking caused by the greater flexibility of big low-pressure cords.

This tested and proven new Lincoln Balloon Shock Absorber will make it easier for you to sell the big balloon tire market and break all your previous sales records. Write for details at once of the Lincoln Franchise and particulars about the new Lincoln Balloon Shock Absorber.

**LINCOLN PRODUCTS COMPANY**

2651 North Kildare Ave.

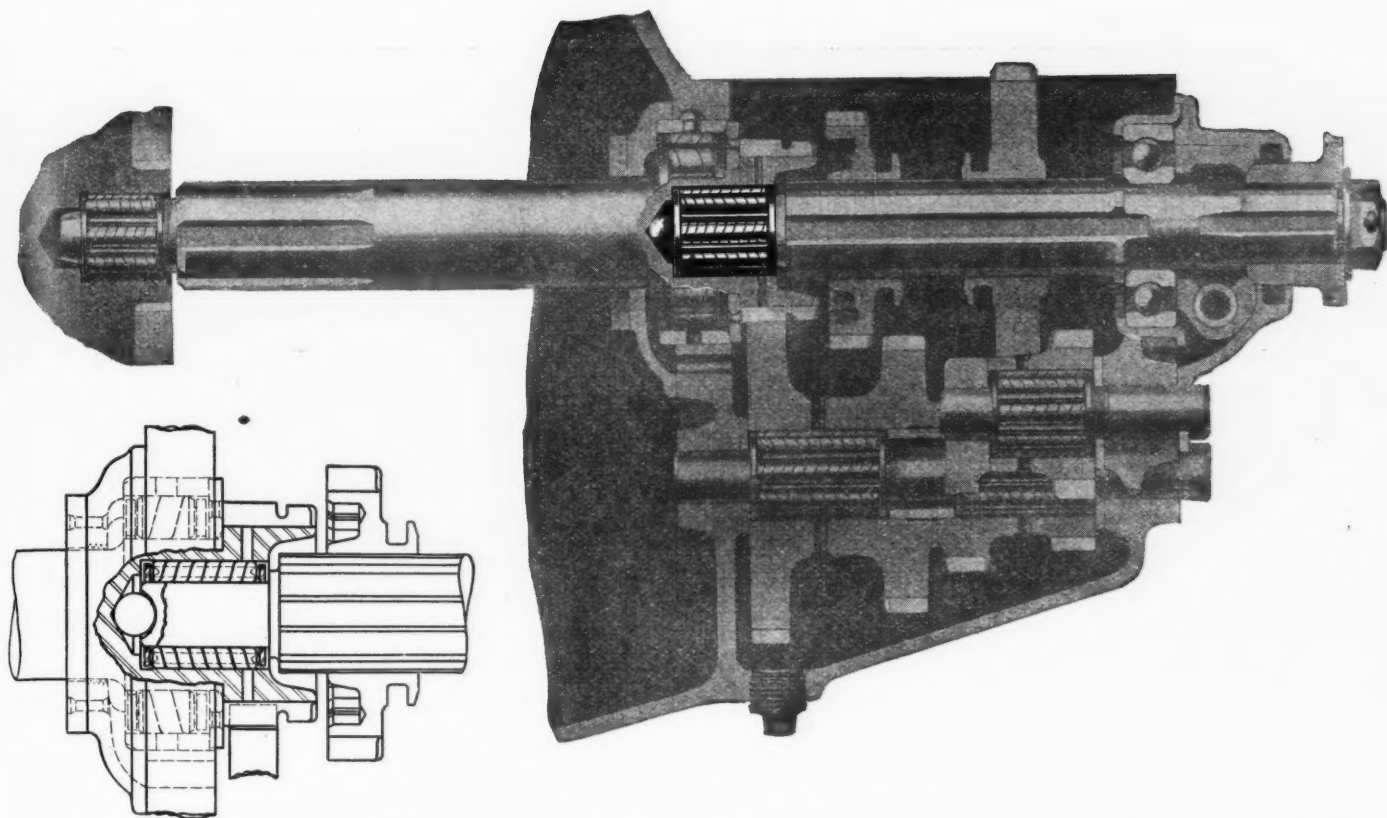
Chicago, Ill.

Canadian Factory: Lincoln Products Company, Ltd., Montreal

# **BALLOON SHOCK ABSORBER**

*(For All Cars \$19.00 to \$40.00 per set of four)*





## Higher Quality Transmissions at Low Cost

### No. 2 *In the Pocket Position*

Hyatt bearings, with their durability and lubrication advantages, are ideal for the pocket position. Their use insures higher quality transmissions that will eliminate costly service charges.

Plain pocket bushings wear rapidly, rattle and have to be replaced. Hyatt bearings save this expense for their wear is negligible and they seldom, if ever, need to be replaced.

In renewing a plain pocket bushing, it is very essential that it be accurately reamed to size to receive the end of the main shaft. This is a difficult operation and few garages are equipped to do it. It must be carefully and skillfully done or wear and noise will develop rapidly. In the few cases where Hyatt bearings have to be renewed the installation is extremely simple.

The pocket position in a transmission is, of course, hard to lubricate at best. In cold weather, when the oil is stiff, plain bushings are often scored before the lubricant can begin to circulate. This causes premature wear, looseness and noise. Hyatt bearings, on the other hand, can operate temporarily without lubricant and be in no danger of wearing. They will continue to run just as quietly and efficiently after operating under such adverse conditions as they did before.

Hyatt bearings are carefree bearings. In the pocket position of a transmission they need no attention, but will continue to function quietly and with lasting satisfaction for years. Install them for dependable, quiet transmission performance.

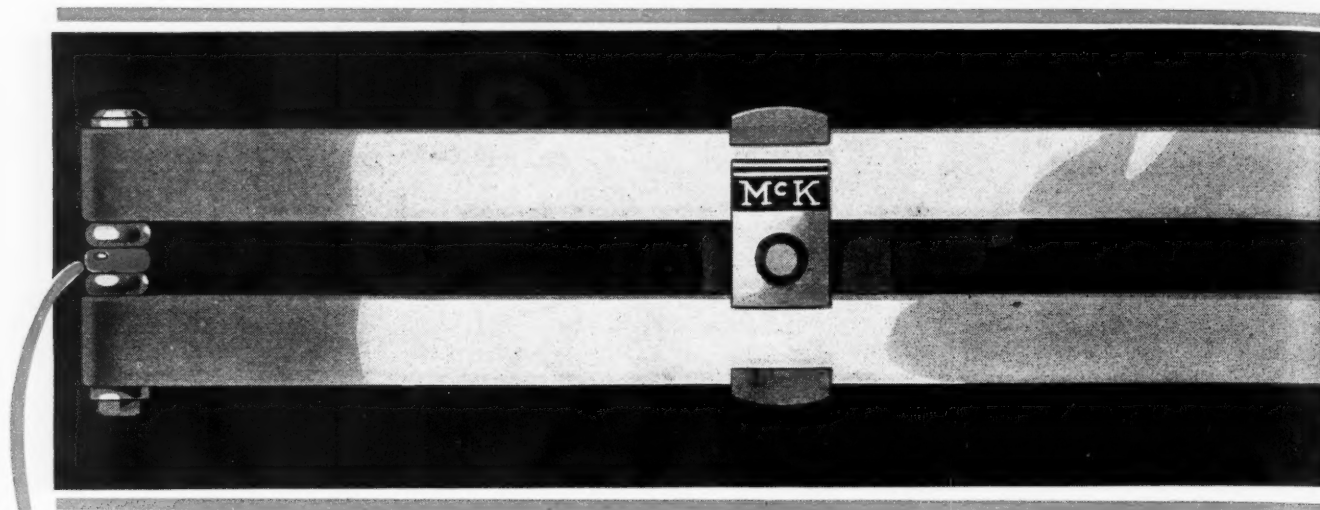
**HYATT ROLLER BEARING COMPANY**

NEWARK DETROIT CHICAGO SAN FRANCISCO

MILWAUKEE WORCESTER CLEVELAND PITTSBURGH PHILADELPHIA

**HYATT**  
*Quiet*  
**Roller Bearings**





# It's New, It's Better,

## McKay Red Bead Construction

McKay Bumpers are positively identified by their attractive bright red beads, and the whole bumper is made stronger and more rigid by this patented bead end construction.

The end bolts are held away from the bars and beads by patented flange washers. Shocks are absorbed by the beads and bars, leaving the bolts firmly in place and the bumper bars rigid and always in perfect alignment.



**The McKay Side Guard**—Four-way protection! This novel invention protects the sides of cars in congested traffic and in parking.



**The McKay Standard Single Bar**—McKay quality in material, design and construction.

Here's NEWS: A complete line of bumpers made by the makers of the famous McKay Tire Chains. An improved line, with the greatest advancement in bumper construction in many years.

Every McKay Bumper is more attractive, every one has greater protective qualities, every one has patented fittings that are stronger and yet simple to use.

Before these bumpers were designed a nationwide study was made among motorists and dealers to determine what has been lacking and what has been demanded in bumper construction. Then McKay Bumpers were made to meet these very demands—to give the motorist the stronger, better-looking bumper with more

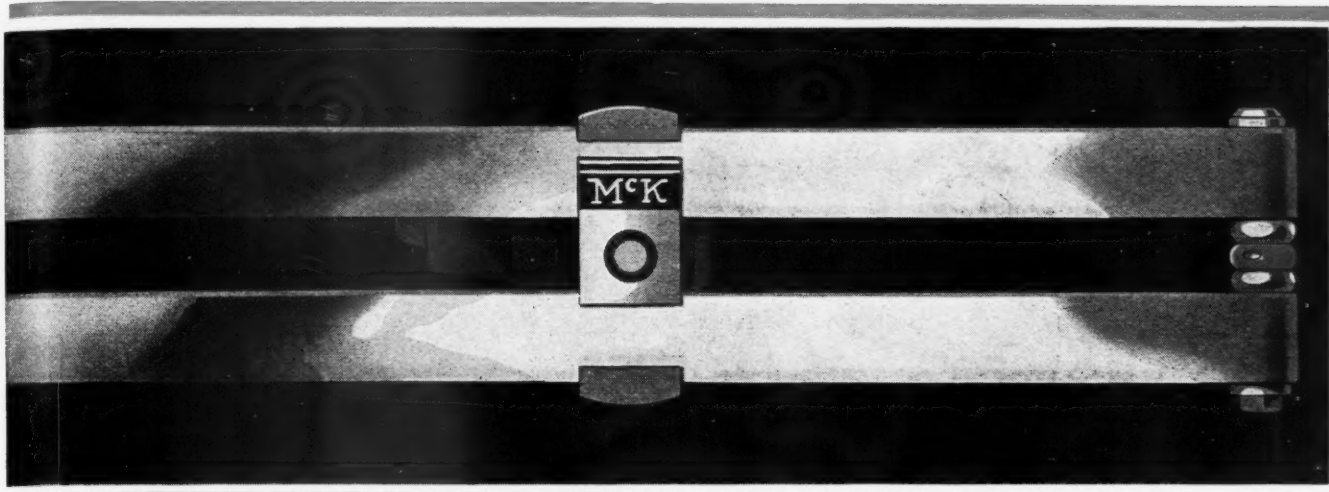


**The McKay Standard Triple Bar**—Maximum protection for every vital part of the car.

# McKAY RED BEAD BUMPERS

# McK





# It's a McKay! ~ ~

positive protection which he has wanted, and to give the dealer a more popular bumper that can be quickly installed without altering the car in any way.

The McKay line of Red Bead Bumpers meets every demand of motorist and dealer alike. *A better bumper backed up by more aggressive publicity*, means new sales, more sales, quicker profits. It represents a real dollars and cents opportunity, and you owe it to yourself to get *all* the facts to help you decide what this opportunity means to you. *Write today.*

**UNITED STATES CHAIN & FORGING CO.**  
Union Trust Building, Pittsburgh, Pa.

*Makers of the Famous McKay Tire Chains—the Better Black Chains in the Red Band Bag.*



*The McKay Perfection—An entirely new and improved idea in bumper design.*

## The McKay Improved Standard Fittings

In McKay Red Bead Bumpers the bracket arm, as well as the bumper bars, absorbs the shock, giving double the strength and resiliency of ordinary bumpers. The bracket is a curved arm of the best spring steel, capable of cushioning repeated blows and yet returning to its original position unharmed.

McKay bumper bars are held in a vise-like grip by a special clamp and will not shift from side to side. This bar clamp and the bracket arm are joined by a hinge connection which still further increases the cushioning ability of the bumper.



*The McKay Imperial—The most beautiful bumper ever made. Has double the strength of ordinary bumpers yet weighs less.*

# McKAY RED BEAD BUMPERS

# McK





When you see an Empire cold punched nut *on a* New Process bolt, you see the most perfect bolting combination that mechanical genius has been able to devise.

**RUSSELL, BURDSALL & WARD**  
**BOLT & NUT COMPANY**

PORT CHESTER, N.Y.

PEMBERWICK, CONN.

CHICAGO

SAN FRANCISCO

ROCK FALLS, ILL.

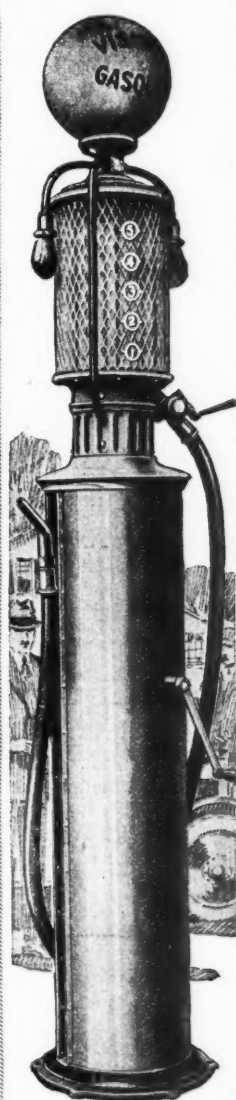
*Makers of Bolts, Nuts and Rivets Since 1855*

**EMPIRE**  
**BOLTS & NUTS**





# Introducing the Newest Member of the American Family



Cut 140-V

A moderately priced Visible Gasoline Pump fitted with a special Blackmer rotary pump, with container, in which adjustable overflow does the measuring — made to meet the demand for a CHEAPER pump.

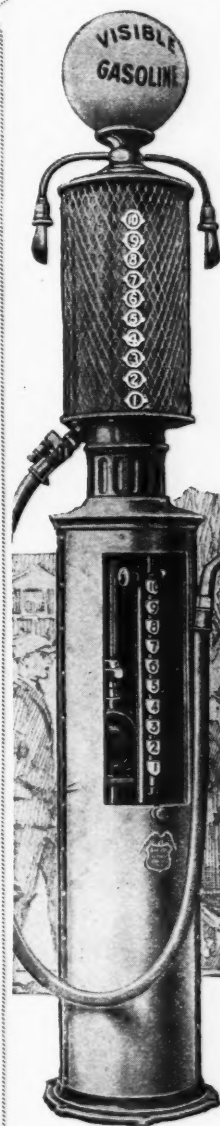
Furnished with either five or ten gallon visible container. Like all American Pumps, Cut 140-V is attractive in appearance, of substantial construction, quick and easy to operate, and at the price, is without an equal in the market.

This pump is of special interest to oil companies looking for moderately priced equipment that is dependable, that gives continuous and satisfactory service, and that is very economical in operation.

Write for full information.

**The American Oil  
Pump & Tank Co.**

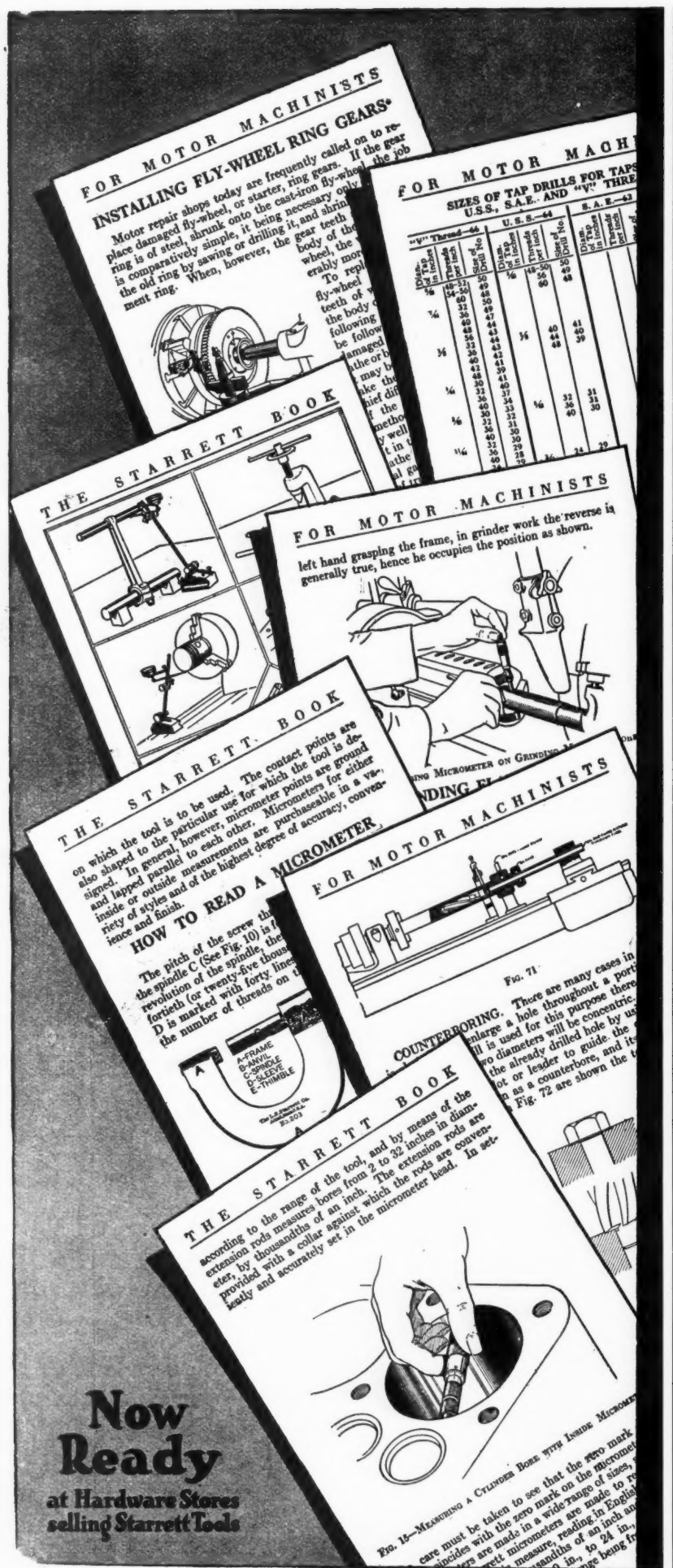
1159 Findlay St., Cincinnati, O.



Cut 340-V

## American Visible Equipment





**Now  
Ready**  
at Hardware Stores  
selling Starrett Tools

# The Book That Shows How To Do It RIGHT!

## Partial Table of Contents

LAYING OUT WORK  
 DRILLING (selecting speeds and feeds, grinding drill points, counterboring, etc.)  
 TAPPING (regrinding taps, removing broken taps, use and care of dies, etc.)  
 REAMERS AND REAMING  
 FILING  
 HACKSAW CUTTING  
 GRINDING (wheel selection, mounting, dressing, lapping, etc.)  
 LATHE WORK (care, indication, adjusting, locating centers, setting tools, testing, turning, checking)  
 HOW TO READ AND THE ADJUSTMENT OF MICROMETERS  
 MILLING AND MILLING MACHINES  
 THREAD CUTTING  
 FITS AND FITTING  
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 CYLINDER HONING  
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 VALVE FITTING  
 FITTING CRANKSHAFT AND CON-ROD BEARINGS  
 ADJUSTING TAPPETS  
 SHIM FITTING  
 DECARBONIZING  
 THE ACETYLENE TORCH  
 WELDING, SOLDERING AND BRAZING  
 CHAIN DISCOUNTS (how to figure)  
 DEFINITION OF ELECTRICAL TERMS

## Tables Covering

Decimal equivalents of Fractions of an Inch  
 Depth of drilling necessary to remove given weights of different metals when balancing machine parts, etc.  
 Assortments of Drills for Tapping  
 Melting Points of Metals  
 Piston Displacements  
 Wire and Sheet Metal Gages  
 Wood Screw Specifications  
 How to tell Carburetor sizes  
 Anti-Freezing Solutions  
 Maximum Power Required to Drive Machine Tools  
 Equivalent Annular Ball Bearings  
 Horsepower Table by N. A. C. O. Formula  
 Grades of Grinding Wheels  
 Grain Numbers Commonly used in various polishing operations  
 Woodruff Key Sizes  
 Rules for Figuring Tapers  
 Cutting Speeds and Feeds for Turning Tools  
 U. S. Standard Screw Threads  
 Tap and Body Drills  
 Taper Reamers for Standard Taper Sockets  
 Wrench Sizes for Bolts, Nuts and Cap-Screws  
 Continuous Drill Table  
 Definitions of Symbols used on Wiring Diagrams



# *At Last* /

## A PRACTICAL HAND BOOK *for the* MOTOR MACHINIST *and* AUTO REPAIR MAN

*The Book you've been looking for*

Here it is—the Starrett Book for Motor Machinists and Auto Repairmen; first and only book of its kind ever published. Contains over 200 pages of useful working data covering machine tool operations and the uses and value of machine and precision tools in auto repair work. And when you look it over you'll say three loose quarters never brought more value.

This Handbook has been prepared by authorities in the automotive world. Written for the man in the shop. Profusely illustrated. Diagrams. Tables. Well printed. Bound in handsome red Athol imitation leather. Handy size ( $4\frac{3}{4}'' \times 7\frac{1}{4}''$ ) for carrying in pocket. In every way Volume III of the Starrett Books is a fitting companion to Volumes I and II (The Starrett Book for Machinists' Apprentices and The Starrett Data Book for Machinists) of which nearly 100,000 copies have been bought by skilled machinists as well as those learning the metal working trades.

If you work on a car this Starrett Book will pay for itself a hundred times over. Get it for 75c at any hardware store selling Starrett Tools. If there is no dealer near you, send 75 cents and we will mail you a copy with charges prepaid. Whichever you do—ACT PROMPTLY. The first edition is limited and these practical handbooks will go fast.

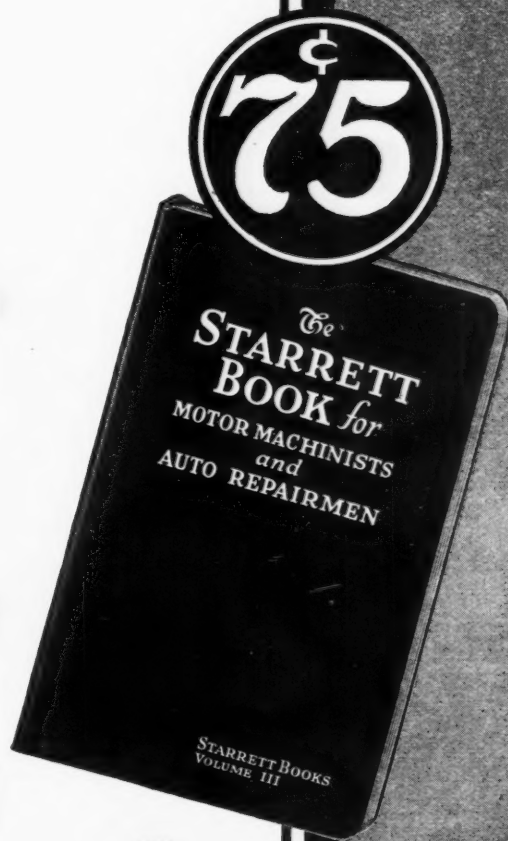
Write for the new Starrett Catalog No. 23  
RB describing over 2200 fine Precision Tools.

THE L. S. STARRETT CO.

World's Greatest Toolmakers  
Manufacturers of Hacksaws Unexcelled  
ATHOL, MASS.



# The STARRETT BOOK *for* MOTOR MACHINISTS *and* AUTO REPAIRMEN

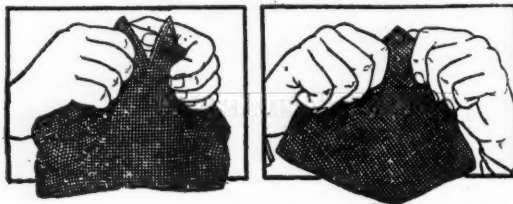




# GATES BELTS

*"The Standardized Fan Belt"*

## *Try this test*



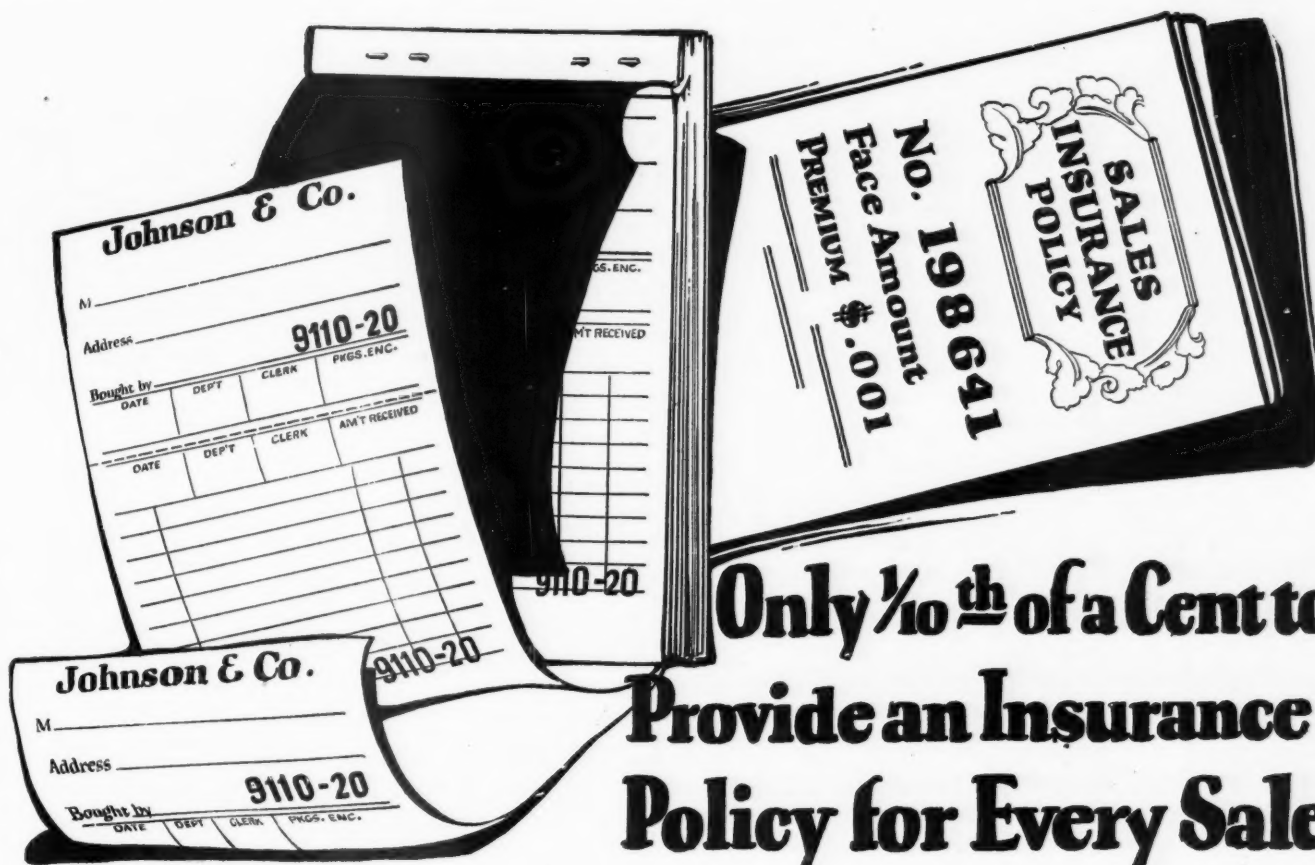
Take a piece of light fabric that you can tear easily in this manner—that is, straight across. Then try to tear it **diagonally** as in the next picture.

You find that it has double strength **on the bias**—a good illustration of the extra strength and durability of the **bias** weave construction.

A simple test—this trying to tear cloth on the **bias**—and it shows exactly why the bias weave construction (patented) gives Gates Vulco Belts their double durability.

Made by the World's Largest  
Manufacturers of Fan Belts.





## Only $\frac{1}{10}$ th of a Cent to Provide an Insurance Policy for Every Sale

Your store building, both fixtures and stock, are fully covered by insurance. If a fire sweeps your establishment, you get back every penny.

But what protection do you carry against loss from carelessness and from systems which are not quite adequate? Such losses amount to thousands of dollars every year, when only one-tenth of a cent would insure cash in the till or a charge on the ledger for every sale.

Just one-tenth of a cent per sale! That is all it costs for Sure-Trip and Sure-Quad protection. Users of these newest and most advanced types of sales books save their full cost over and over again by preventing loss, by protecting their business at every point in each transaction, and by furnishing additional live

facts which help them manage their organizations better.

All this is brought about by the special features Sure-Trip and Sure-Quad possess:

1. Three or four copies are joined together when removed from the book.
2. They produce more copies in one writing.
3. One complete set of numbered copies may be kept permanently bound for reference.

These features often make possible the combination in one book, of two or more sets of forms now in use. Learn more about how this insurance can be applied to your business. Send the coupon or call our local office for our new Sure-Trip booklet, which tells what these books are now doing for others.

### American Sales Book Company, Ltd., Elmira, N. Y.

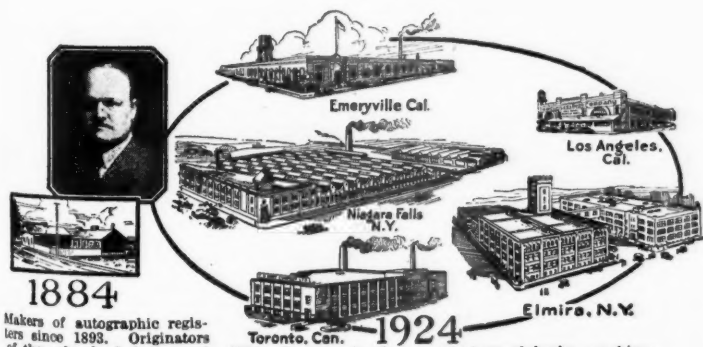
*West of the Rockies*

Pacific Manifolding Book Co.,  
Emeryville, Cal.

Pacific Coast Sales Book Co.,  
Los Angeles, Cal.

*In Canada*

F. N. Burt Company, Ltd.,  
Toronto, Can.



Makers of autographic registers since 1893. Originators of the sales book industry in 1884. Pioneers in the manufacture of books, machines and forms using carbon paper.

**PIN TO FORMS NOW USED OR TO LETTER HEAD**

Mail to our nearest plant

American Sales Book Company, Ltd.  
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F. N. Burt Company, Ltd.  
Toronto, Canada

Pacific Manifolding Book Co.  
Emeryville, Cal.

Pacific Coast Sales Book Co.  
Los Angeles, Cal.

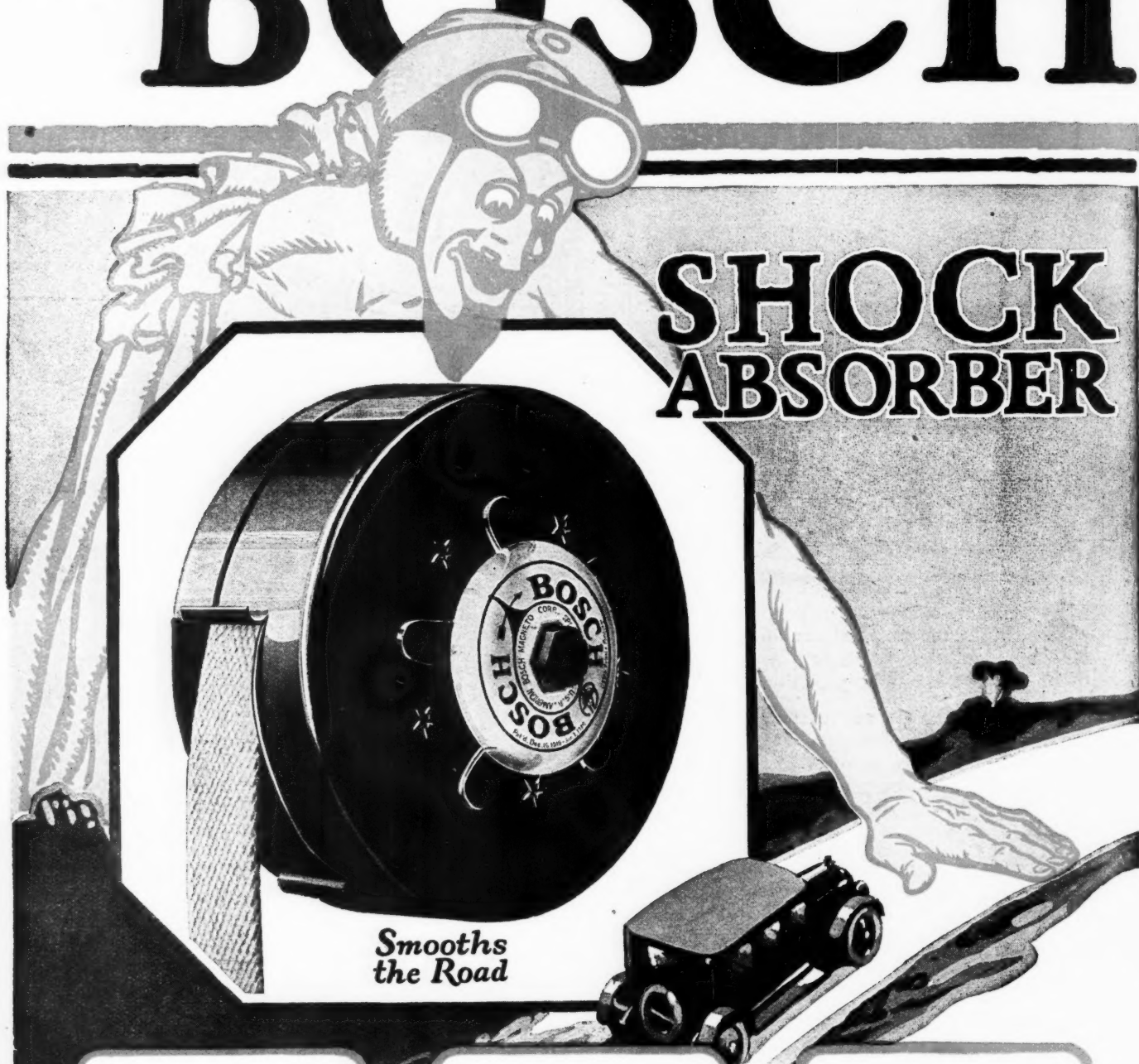
☐ Send me your new Sure-Trip booklet and time and money-saving forms.

☐ Tell me how Sure-Trip books can be applied to my business.

Name..... Dept. A7280



# The BOSCH



## SHOCK ABSORBER

*Smooths  
the Road*



**BOSCH  
IGNITION  
SYSTEM  
FOR  
FORDS**

**TYPE  
600**

Insures quick, easy starts, clean plugs, added power. Has automatic spark advance—is waterproof. Prevents all ignition troubles. Price, \$12.75.



**BOSCH  
ELECTRIC  
WINDSHIELD  
WIPER**

An absolutely reliable automatic cleaner that is operated electrically. Not affected by engine speeds. Puts no burden on the battery. Price, \$9.50.



**BOSCH  
RED  
SPARK  
PLUGS**

The big sure firing, gas tight plug with the unbreakable insulator and the real nickel electrodes. Get the genuine—it's red! Regular sizes \$1.00, Ford size 75c.



# Long Line

## Kill Balloon "Shimmy" with Bosch Shock Absorbers



Bosch Shock Absorbers are "tandeming" up with Balloon Tires everywhere.

**1st** Because they are adjustable—by turning a dial it is possible to regulate the amount of control until it exactly meets the balloon tire requirements.

**2nd** Because they control small spring actions gently without interfering with the cushioning effect of the tires. But because of the quick action and scientific construction, they instantly dampen with silky smoothness all severe rebounds, no matter how fast or heavy they come.

**3rd** Because they absolutely prevent the galloping and "shimmy" motions which a balloon tire-equipped car develops at certain speeds.

Because of these and other superior features, Bosch Shock Absorbers are being enthusiastically recommended by tire manufacturers and dealers everywhere.

Get a set for the car you sell or drive. Lead the procession—Sell Balloon Equipment, but be sure Bosch goes on too.

### AMERICAN BOSCH MAGNETO CORP.

Main Office and Works—Springfield, Mass.

Branches: New York Chicago Detroit San Francisco

**DEALERS:** Big advantages open to live dealers who can become Bosch Sales Agents and sell the Bosch Long Line of Automotive Necessities.

## Another BIG REASON

why dealers prefer the Bosch is:—It is not necessary to carry a lot of special types in stock for various makes of cars, nor are special types necessary for Balloon Tires. The three (3) standard Bosch sizes enable you to equip all cars satisfactorily.

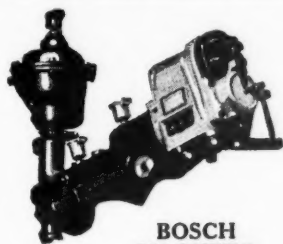
That makes sales easy, insures a quick "turnover" and saves tying up a lot of money in stock.

### PRICES PER PAIR

For Fords .....\$10  
In Canada \$15.

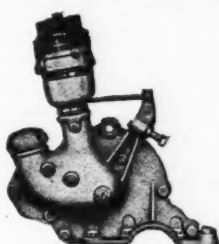
For Medium Cars.....\$15  
In Canada \$22.50.

For Heavy Cars and Trucks..\$20  
In Canada \$30.



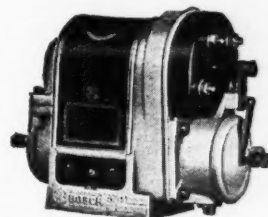
**BOSCH  
MAGNETO  
FOR  
FORDSONS**

Provides Bosch High Tension Magneto Ignition for Fordsons. Eliminates coils and timer. Prevents all ignition troubles. Installed with, or without the Bosch Throttle Governor. Prices on request.



**BOSCH DE LUXE  
IGNITION SYSTEM  
FOR FORDS  
TYPE 513**

Includes the Bosch Coil, and Bosch Compensating Governor, which automatically advances and retards the spark to exactly meet the Ford engine's characteristics. Wonderfully efficient. Price, \$25.00



**BOSCH  
HIGH TENSION  
MAGNETO**

The world's most dependable ignition system—over four million in use today—in demand everywhere for use on cars, trucks, tractors, motorcycles, motor boats and stationary engines. Price on request.



# Big Profits *Quick and Easy* *with* **HEMPY-COOPER** **Rebabbitting Appliances**

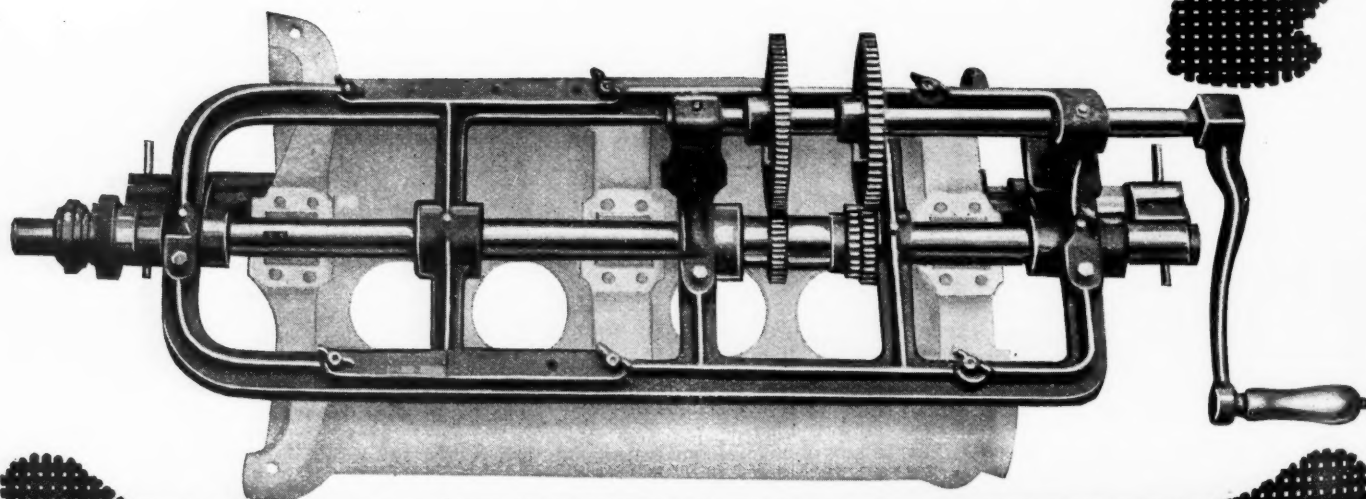
Here's equipment that means **BIG EXTRA PROFITS** for every Ford and Fordson repair shop or service station! The Hempy-Cooper Machine with one continuous operation in straight alignment bores all three main bearings in Ford and Fordson cylinder blocks. Adjustable to worn crankshafts. This boring operation is done with absolute accuracy in less than 30 seconds with an electric drill and requires but little more time by hand.

We also manufacture the most improved type of connecting rod jigs for replacing babbitt bearings in rods of all makes of cars and a machine to accurately bore these bearings. These tools are obtainable from stock for all makes of cars and can be furnished on short notice for any American built car; also foreign cars, on receipt of rod to be serviced or blueprint specifications for same. These tools are being used everywhere by commercial rebabbitting and cylinder grinding shops, service stations and fleet owners.

**Investigate!** Double your shop profits—save time and labor! 65 leading shop equipment jobbers can supply you with Hempy-Cooper Boring and Rebabbitting Appliances. Ask your jobber for full particulars, prices, etc. If he cannot supply you, write us direct.

## HEMPY-COOPER MFG. CO.

412 Archibald Ave., Kansas City, Mo.







## *An Added Profit Now on Every Car You Service*

**B**UNTING Bushings for replacement in steering knuckle and tie rod open a new field of profit opportunity for the garage and service man.

Practically every car that has run very far needs new bushings at these points. It is easy to put new bushings into the steering knuckle

and tie rod assembly. The job can be done in a few minutes by any service shop mechanic.

BUNTING replacement bushings for all popular automotive vehicles now include Piston Pin Bushings shown on List No. 18, Spring Bolt Bushings shown on List No. 111, and Steering Knuckle and Tie Rod Bushings shown on List No. 415. These lists will be sent on request.

**THE BUNTING BRASS & BRONZE COMPANY**  
TOLEDO, OHIO

*Branches and Warehouses at*

**NEW YORK**  
245 West 54th St.  
Circle 0844

**CLEVELAND**  
710 St. Clair Ave., N.E.  
Main 5991

**CHICAGO**  
722 S. Michigan Ave.  
Wabash 9153

**PHILADELPHIA**  
1330 Arch Street  
Spruce 5296

**SAN FRANCISCO**  
198 Second Street  
Douglas 6245

**BOSTON**  
36 Oliver Street  
Main 8488

# BUNTING BUSHING BEARINGS

PATENTED

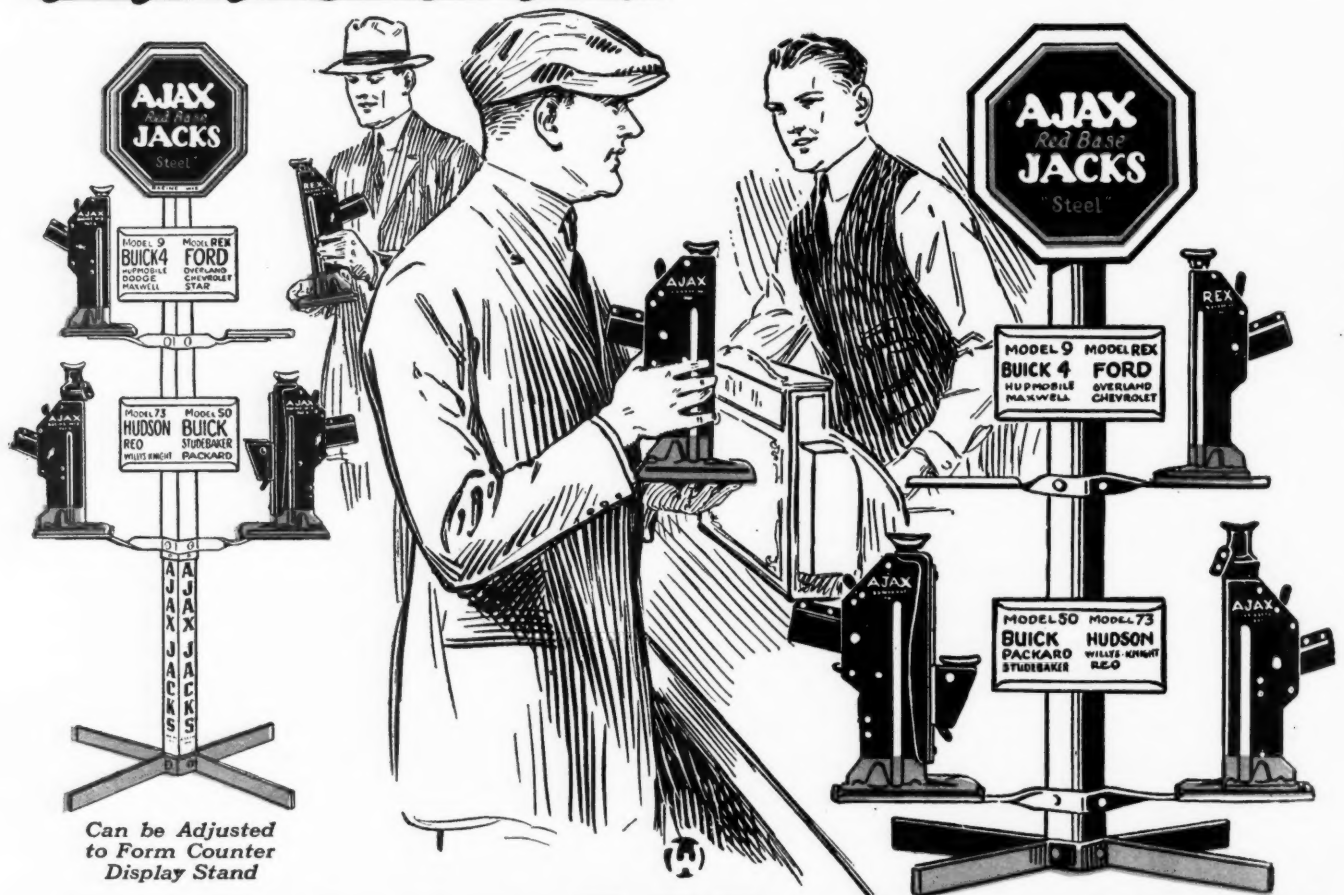


Speed Up  
Your  
Jack Turnover  
This  
Way

**T**HOUSANDS of dealers have increased their jack turn-overs with the Ajax Red Base (4 model) Jack line. Every one of the 4 models is in active demand. And the Ajax display stand which is furnished FREE to dealers urges motorists to "Buy-a-Jack" and answers their questions as to proper size, capacity, etc.

Your jobber's salesman will be glad to tell you how you can get a combination floor and counter display stand FREE with an assortment of 12 Ajax Red Base Jacks that are standard equipment on 22 of the best-known makes of automobiles.

**AJAX AUTO PARTS CO.**  
Dept. A509 RACINE, WISCONSIN



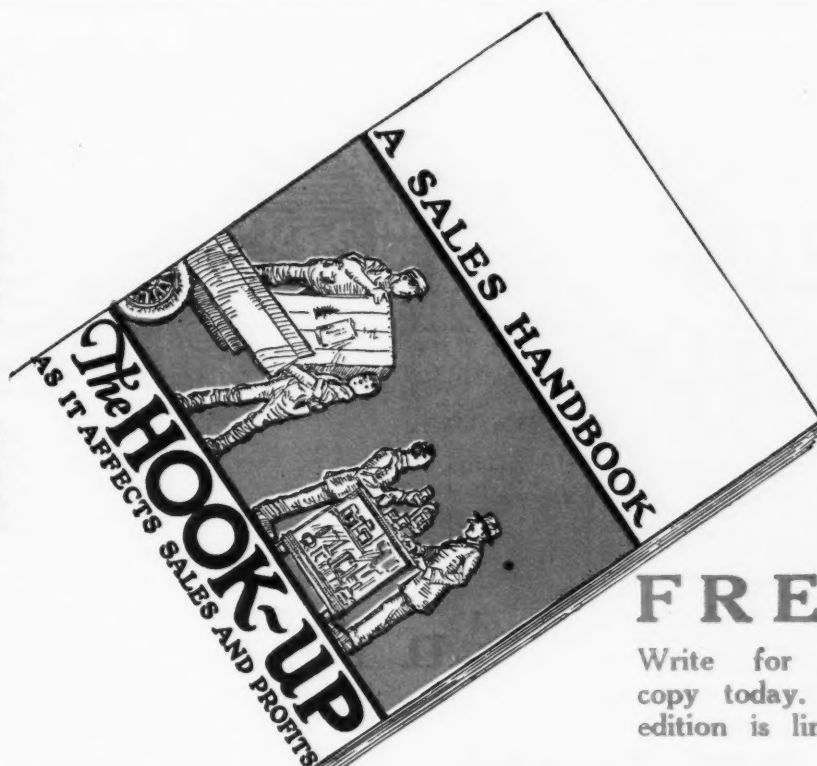
**AJAX RED BASE JACKS**



**I**N almost every community you will find one or two merchants, perhaps more, who get on better than the others. They seem to have the magic formula for making money. Although to outside appearances, their merchandising methods do not differ greatly from those of their less fortunate competitors—still they manage somehow to make their efforts pay them larger dividends.

They build fine homes, live on the best streets, enjoy life. We say—"they're lucky!"

But are they lucky? You would probably find, if the facts were available, that the magic formula is nothing more nor less than knowing their merchandise better and knowing better where and how to buy it.



**FREE**

Write for your copy today. The edition is limited.

## Good Profits if you know how!



### SE-MENT-OL

The original Radiator Repairer. The only repair guaranteed for the life of the machine. In liquid or powder form.

### TOP AND UPHOLSTERY DRESSING

for leather and pan'asote. Waterproofs, renews, freshens, preserves and stays put.

### PENETRATING OIL

Poured along outer edges of springs. It penetrates between the leaves, cuts the rust and deposits oil and graphite.

### KHAKI

water proofing.

### TOP DRESSING

and lining dye. Produces a rich khaki color and makes the top rain proof.

### NORWESCO PRODUCTS

cover the whole range of the dealers and car owners needs.

The line is complete and there is a sales advantage in handling one good line.

Successful dealers know that the "hook-up" behind a line of merchandise is just as important as the merchandise itself. Both must be satisfactory if full profit is to be realized.

This matter of "hook-up" is worthy of your study—indeed it is a phase of your business on which your success may depend.

It was in order to set down in simple usable form those principles of "Dealer Buying," which are the pre-requisite of

good merchandising, that we have compiled the handbook here offered.

Whether you handle the Norwesco line or not you will want this little informative booklet.

It covers the whole subject—Buying—Selling—Profits.

The book is free—no strings attached.

Write for your copy.

**THE NORTHWESTERN  
CHEMICAL CO.**  
MARIETTA OHIO

# NORWESCO PRODUCTS



This Coupon is for your convenience in asking for the Norwesco handbook.

The  
Northwestern  
Chemical Co.  
MARIETTA, OHIO.

Gentlemen: Please send a copy of your handbook—"Hook-up" to

Name .....

Address .....



## For Automobiles



Prest-O-Lite Batteries are standard equipment on a large and ever-growing list of America's famous automobiles.

## For Radio "A" Batteries



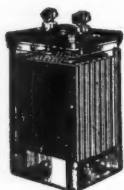
Radio users without exception have found Prest-O-Lite "A" Batteries highly dependable and steady in their current out-put.

## Super-Service "B" Batteries



Prest-O-Lite wet "B" Batteries give years of constant, dependable service. An occasional recharge and they're as good as new. Their initial cost is surprisingly low.

## For Light and Power



Prest-O-Lite Batteries for light and power equipment have a national record of dependable performance.



The Sign of  
"Friendly Service"  
Service Stations  
Everywhere

## An Achievement in Values

The Battery Distributor who can sell at \$14.65, a high quality, full capacity battery which formerly sold for \$20.50, carrying a nationally known name, can dominate the battery business in his territory.

This is only one example of the new price reductions in the entire Prest-O-Lite line. And this is the Improved Prest-O-Lite, the battery used by a steadily growing list of America's famous automobiles. It is built with the stamina and dependability characteristic of all Prest-O-Lite products.

It is the most extraordinary battery value ever offered the motorist. He will be quick to realize it, and today he makes his purchase from the merchant who can give him the greatest value for his dollar.

This Achievement in Values could

be accomplished only by an organization such as Prest-O-Lite, with its enormous resources, up-to-date manufacturing methods, and perfected system of distribution.

A battery dealer handling such a well-known battery at this price will control the battery trade of his town and also increase his business in recharges, accessories, repairs, etc., because he is bound to attract car owners.

Remember—price reduction is now in effect on every battery made by Prest-O-Lite. The dealer handling Prest-O-Lite Batteries can meet every class of battery competition—Starting and Lighting, Radio "A" and "B", Light and Power.

Are you going to be a Prest-O-Lite distributor? Send in the coupon today and learn about our full new complete line.

Investigate the very latest battery development—  
Our Prest-O-Lite Super-Service Battery.

THE PREST-O-LITE COMPANY, Inc.  
INDIANAPOLIS, IND.

New York Office: 30 East 42nd Street  
Canadian Factory: Prest-O-Lite Company of Canada, Ltd., Toronto, Ont.

Pacific Coast Factory: 599 Eighth Street, San Francisco

## COUPON

The Prest-O-Lite Co., Inc., Indianapolis, Ind.  
Enclosed please find 4c in stamps for my copy of the  
"Prest-O-Lite Service Station Manual."

Name \_\_\_\_\_

Street \_\_\_\_\_

Town \_\_\_\_\_

State \_\_\_\_\_

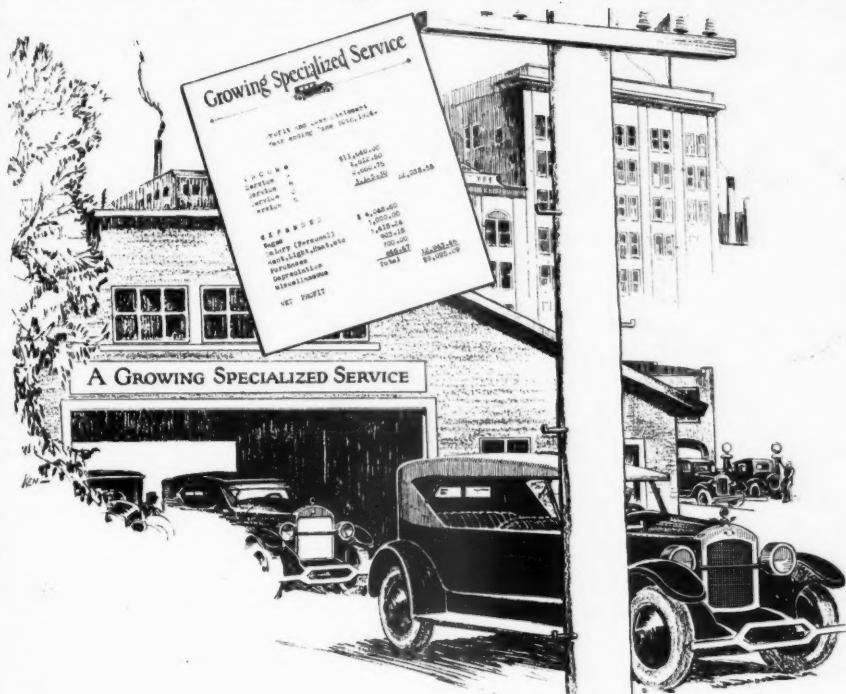
Name of Battery now handled \_\_\_\_\_

# Prest-O-Lite

THE OLDEST SERVICE TO MOTORISTS



# You can own this business





*Make*

# Profits

*the  
dominating factor  
in your business*

#### PROFITS vs. VOLUME

1. Profit the Motive of All Business.
2. A New Business But Old Principles.
3. Where Profits Come From.
4. How to Determine Mark-Up for Profit.
5. Meeting Competition That Cuts the Percentage.

#### ECONOMICS OF PURCHASING

1. Profit Starts With Buying.
2. A Well Selected Stock.
3. Buying From Reliable Sources.
4. Take Discounts to Reap Profits.
5. Know the Merchandise You Buy and Sell.

#### UTILIZATION OF PLANT CAPACITY

1. Profitable Use of Plant Capacity.
2. Departments Essential to Transportation Store.
3. How Much Is Enough Space.
4. Displaying and Storing Stocks.
5. To Build or Remodel.

#### COST OF SELLING

1. Gross Margin Is Not Net Profit.
2. The Cost of Selling.
3. Overhead Must Be Met.
4. Salaries and Wages.
5. Maintenance Service As a Profitable Commodity.

#### TURNOVER OF CAPITAL

1. Relation of Profits to Capital.
2. How Money Works.
3. Your Banker Is Your Friend.
4. Turnover Creates the Margin.
5. In Return for Profit.

It's not the amount of business you do, but how much profit you make, that counts. Increasing the volume does not necessarily mean increasing the profits. On the contrary, many have found this past year that getting—say—the last 10% cost so much that it was not only unprofitable in itself but it wiped out some of the profit on the other 90%.

Since making money is the ultimate aim of all business, there is nothing more important than making the obtaining of satisfactory profits the dominating factor in your business.

A series of articles on this important subject will be published simultaneously in

**Automotive Industries**  
**Motor Age**                      **Motor World**  
**Automobile Trade Journal**

The major theme of all the series will be the same but the articles themselves, the writers, the treatment and the appeal of each will be different.

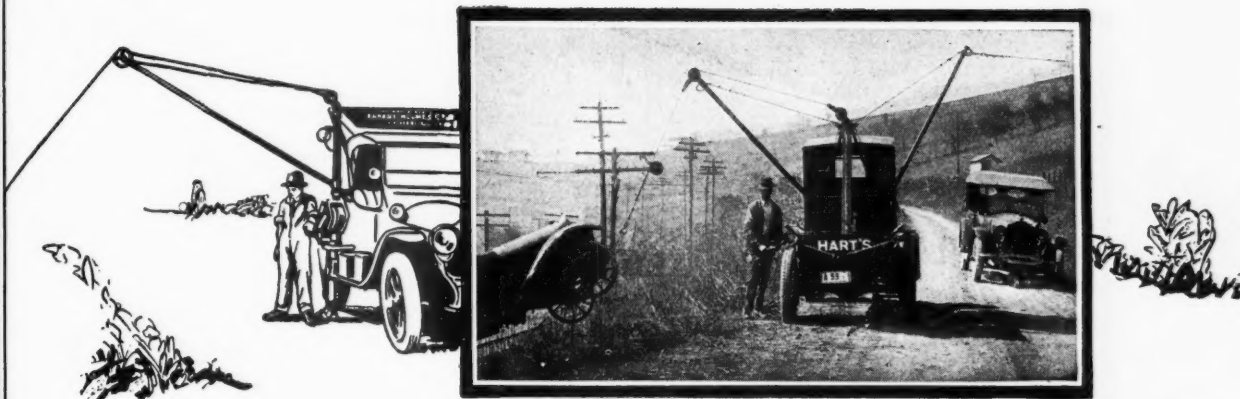
The subjects of the articles which will appear in this publication are given in the panel to the left.

Look for these articles. Make it a point to read them carefully. They are full of helpful suggestions on meeting the greatest question confronting the industry today.

*Articles Start Issue Sept. 18*



# Increase Your Repair Business with a - **HOLMES WRECKER**



## Easily Operated *from the Ground*

The operating crank on all Holmes Wreckers is placed just a little higher than the average waist line (42 inches from the ground) where experience has shown that the maximum efficiency and operating comfort are secured.

There is no climbing in and out of the service car, nor is the operator forced to handle the crank from a cramped and insecure position. He works in complete comfort with plenty of room.

Additional advantages are secured in Holmes Wreckers by arranging cranks on both sides of the wrecker so that the operator can work from either side and keep his eyes constantly on the job.

The powerful Holmes hoisting mechanism enables one man to unwind the cable with slight exertion. This eliminates the necessity of having a man at the cable end and one at the crank while the cable is being carried to the wrecked car.

*There are 15 vitally important exclusive features which Holmes Wreckers possess. Study them carefully — all of them are essential to maximum wrecking efficiency. Write your jobber for catalog and prices, or see Holmes Wreckers on his floor.*

**ERNEST HOLMES COMPANY**

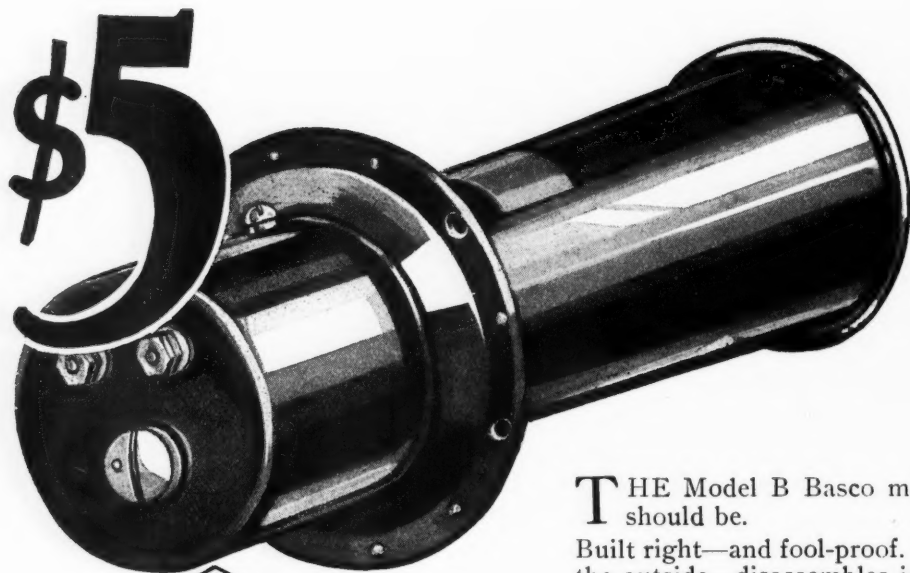
**CHATTANOOGA,**

**TENNESSEE**

### 15 EXCLUSIVE HOLMES FEATURES

1. 100 Foot Operating Range
2. Don't Block Traffic.
3. Transfers Load to the Road.
4. **EASILY OPERATED FROM THE GROUND.**
5. "V" Tow Bars.
6. Swinging Booms.
7. Double Booms.
8. Electric Lights for Night Work.
9. Two Speeds.
10. Full Floating Low Speed Power Shaft.
11. Independent Boom Control.
12. Perfect Balance.
13. Hand or Power Driven.
14. Steel Body.
15. Cable Guards and Guides.





**HORN**  
MOTOR DRIVEN

**Built for  
Service—  
Priced  
to Sell**

THE Model B Basco motor-driven Horn is everything a horn should be.

Built right—and fool-proof. Easily installed—oils and adjusts from the outside—disassembles in a jiffy.

Deep-toned—speaks with authority. Quick-on-the-button—rapid tone pick-up. Motor responds instantly—no lagging.

Good looking—matches the finest cars in quality, and still—

It's priced for the light-car field, where the real volume horn business is. Quick-selling—good turnover—profitable.

Write for details of Basco sales and service proposition and name of nearest distributor.

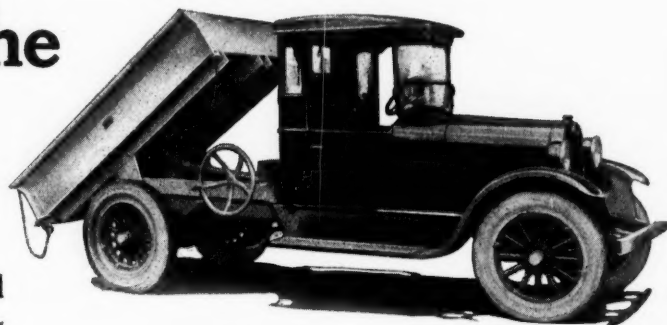
**Briggs & Stratton Co.**  
Milwaukee PRODUCT Wisconsin

## Extra profits in the trucks you sell or have sold!

Equip them with Saftee Dump Bodies and make them big money makers for your customers. Your light truck, 2-ton or less, and a Saftee Body is the ideal outfit for hauling and dumping work requiring great speed, efficiency and low cost. Used successfully for road and municipal work, contracting work, coal delivery, farm trucking, etc.

Easy and safe to operate. Operates thru a worm gear — not ratchets — giving smooth action.

**15 seconds to lower!  
30 seconds to dump!**



SHOWING MODEL B ON GRAHAM BROS. CHASSIS

Strong steel construction. Protected working parts. Attached to chassis in 15 minutes without drilling.

Sell the Saftee Body for new and used trucks and make the good extra profits. Write for full sales information.

**THE DITWILER MFG. CO.**  
Galion, Ohio

Makers also of Automatic Dump Bodies for Fords and Chevrolets

**SAFTEE** *Hand Operated* **DUMP BODY**



# Goodrich MOTOR TESTING Valve

(Replacing Old Style Cutout)



**OPEN:** The valve's heavy knife-like edge shaves off all carbon deposits, inside the cut out every time it operates.

**CLOSED:** The valve fits tight. No rattles—no escaping gas—no annoyance.



## a Cutout that can't chatter

The practical design of the Goodrich Valve is responsible for the popularity and sales record of this cutout.

It has a two-way, revolving type valve—

This valve can never chatter—it does not rely on a spring to hold it closed. It cannot become clogged with carbon. It never requires overhauling, or attention of any kind.

Other big features are:—Light weight; no strain on the exhaust pipe; an extra long shank, insuring rigid support; jig machined parts, insuring perfect fit, and freedom from rattles; a bell mouth opening, insuring loud, sharp staccato notes that makes engine testing easy.

Each Motor Testing Valve is packed in an individual carton, complete with pulley, cable, and pedal, or with dash control ready for installation.

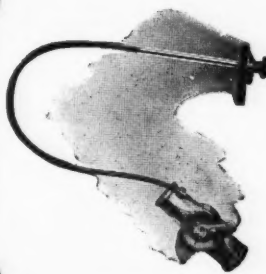
Write for prices, discounts and our booklet giving the right size cutout for every make of car.

**GOODRICH-LENHART MFG. CO.**

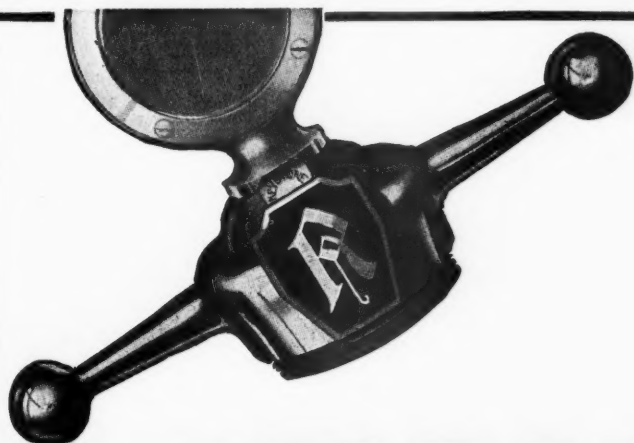
22 Pine St.

Hamburg, Pa.

### The Goodrich Dash Control With Positive Stop



Enables driver to open cutout entirely or partially by hand from seat. Has positive lock—makes control easy. No foot pedal to disconnect when removal of floor boards becomes necessary. Furnished with Goodrich Motor Testing Valve or separately. Ideal for regulating shutters, heaters and the like. List price \$2.00.



### "A Keystone for Every Car"

Three models: Senior, Stalock and Junior. The same initial, monogram and emblem plates fit all models.

Self-locking and permanently theftproof—because they are absolutely rustproof and will not stick or "freeze."

**THE NORLIPP COMPANY**  
568 W. Congress Street  
CHICAGO

# KEYSTONE

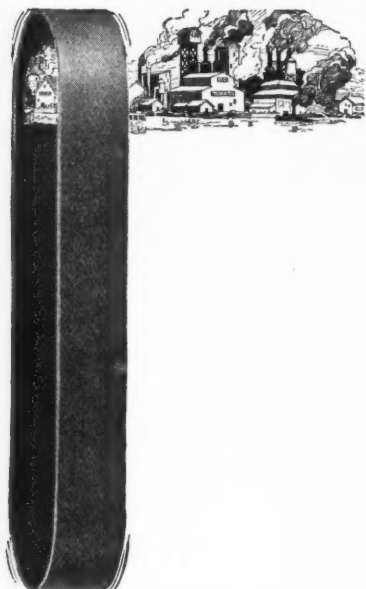
**The Genuine  
RADIATOR CAP**

**With Initials, Monograms and Emblems**





## The third most important replacement part



**F**AN belts are the third most important replacement part in the automobile industry. Are you getting your share of this business?

To realize the most from this third most important part, sell Graton & Knight Fan Belts. They are better belts to handle for two reasons:

First—*profit*. Priced right to make you a good margin. Backed by a square proposition that discourages price cutting. Easy to sell because the quality is known.

Second—*satisfaction for your customers*. Made of famous Graton & Knight Standardized Leather, Graton & Knight Fan Belts resist motor heat, oil and water. They run straight and true. Cling to the pulley at low tension—so save bearings. Keep their shape. Do not require frequent tightening. Stand up under the hardest usage.

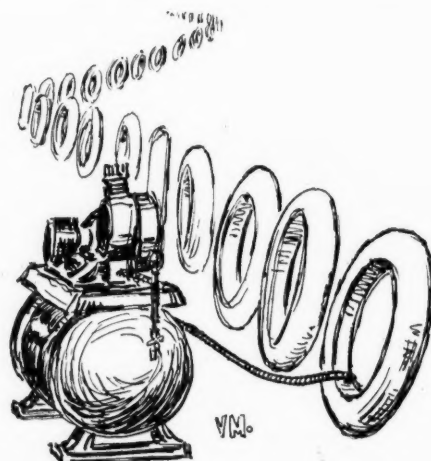
Graton & Knight Fan Belts are made in Flat, "V," and Link "V," types. Standardized for every pleasure car or truck. They will increase your fan belt business. Write to your jobber to-day for prices and full information.

**THE GRATON & KNIGHT MFG. CO.**  
*Tanners—Makers of Belts and Other Leather Products*  
*Worcester, Mass.*



# GRATON & KNIGHT

Standardized  
LEATHER BELTING



## Next!

**F**ILL 'em up quickly and send 'em on their way—that's how a Brunner takes care of soft tires.

A free inflation service that isn't fast and efficient defeats the very purpose for which it is intended. Instead of making friends for you it stirs up grouches.

A Brunner works fast, without the strain of high speed, because it pumps air all the time. No lost motion, no leaky valves. No loose fitting parts. This is the reward of fine work in the factory. Brunners are built right.

A Brunner starts quickly, runs silently, works fast, costs little to maintain, lasts indefinitely and is super safe.

*Write for the Brunner catalogue*

**BRUNNER MFG. CO.**  
UTICA, N. Y.

*Oldest and Largest Manufacturers of  
Garage Air Compressors in the World*

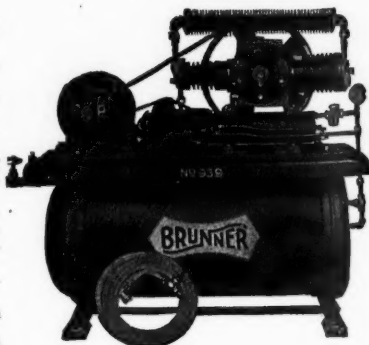
BRANCHES:

Cincinnati      Kansas City      San Francisco  
Export Office: Utica

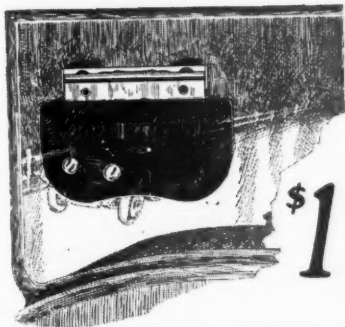


### 1924 Model 939, 2 Stage Compressor

With 20 exclusive features, a few of which are:  
Extra large intercooler.  
Ground contact surfaces.  
Improved Belt Tightener.  
Removable Cylinders.  
Forked-type Connecting Rods—Minimizing vibration.  
Every part built with special tools and gauges, insuring absolute interchangeability.  
Seamless Steel Tank—Insuring absolute safety.  
Solderless Compression Couplings.  
Brunner Patented No. 73 Safety Valve—Absolutely Air Tight.

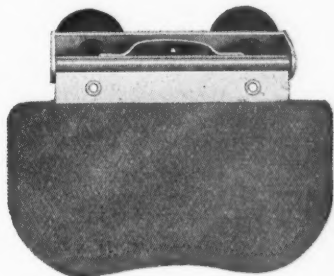






An economical protection — this Welco "Glare-Stop" Shield. Clear profit for you because there's no installation. Just press it on! Easy as ringing up a sale!

\$1



## Stop that blinding glare!

**S**TOP that dangerous, eye-straining glare with a Welco "Glare-Stop" Shield. The deep green "Viscoloid" diffuses the sharp rays of summer sun and penetrating headlights.

Press it on inside of windshield in line of vision (see illustration). The rubber suction cups grip tight and make visor almost immovable. Tilt it to any angle. The spring holds it firm. Hinged to flip out of the way. Rustproof. Good looking. Sample shield and discounts on request. Write for them!



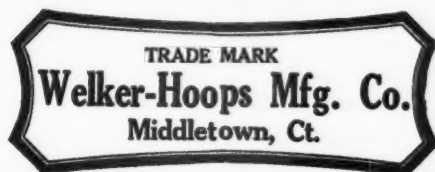
### "Neva-Lost" Gas Tank Cap

*a quarter turn to open or close*

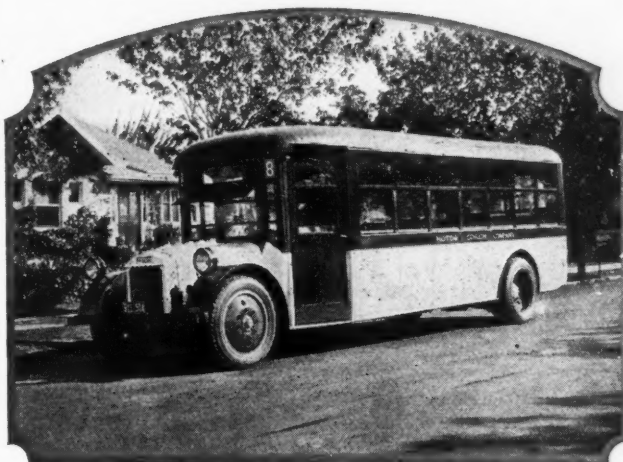
A time saver. A temper saver. A gas saver. Threads on permanently. A turn on the bar handles open and close quickly, cleanly. Spring lock and ground-cork gasket hold lid tight. Nickel plated. Packed in cartons. 3 color display stand free to dealer. Your Jobber stocks them or can supply you promptly.

\$1<sup>50</sup>

# Welco accessories



## "WHITNEY" SILENT CHAINS



### Where High Mileage Chains are Economy!

Chains that can stand the severe service to which these buses are put, prove economical in the long run regardless of price. That's why "WHITNEY" Silent Chains — the High Mileage chains — are used for the front end drive of the engines used in these Fageol buses.

High Mileage means long service, without expensive repairs — Economy.

*Recommend "WHITNEY" Silent Chains for Replacement*

*Name of nearest dealer on request.*

**THE WHITNEY MFG. CO.**  
Hartford Conn.





### Well supplied with selling points, eh?

There are mighty few articles in the Jobber's Stock or on the Dealer's counters that have any more than one use to create selling power.

Buy KEY GRAPHITE PASTE has a dozen and more. Every day some one finds a new place to use KEY GRAPHITE PASTE to advantage.

Its multiplied service to the car owner, to the garage and the service station mechanic smooths the way to big dealer sales—which naturally creates an order for the jobber.

We have many jobbers but we want them all. We have a host of dealers but we want them all. We are entitled to 100 percent distribution for in KEY GRAPHITE PASTE we have an essential product.

*Write Us.*

**KEY BOILER EQUIPMENT CO.**  
27th and McCasland Ave., East St. Louis, Ill.

**--Sample--FREE--**

Key Boiler Equipment Co.  
27th and McCasland Ave., East St. Louis, Ill.

Please send me without charge or obligation a sample of Key Graphite Paste.

Name.....

Business.....

Address.....

Jobber's Name.....

M. A. 9-4

## Victor Products

for Easier, Safer Driving



### No. 25 "Sentinel" The Warning Hand

One of the newest Victor lamps that serves efficiently as a combination PARKING, TRAFFIC, COURTESY, WARNING Lamp.

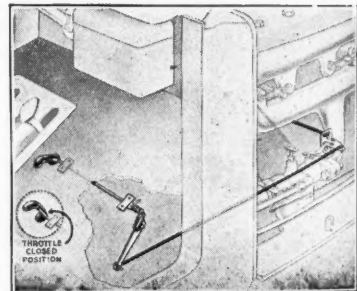
It does not command to stop but gives a friendly warning—a courtesy to the approaching driver.

It flashes a red warning hand to the rear and a white courtesy hand forward.

Furnished with a major and minor filament bulb. Also with a dash switch and pedal switch.

### No. 10 "Simplex" Foot Accelerator

Made for installation on Fords without drilling. Gives a smooth positive action and will not jam. No wires or flimsy fittings to break or work loose. We furnish these in an attractive counter display box containing six individual cartons.



### No. 20 "Barnacle" Dash Lamp



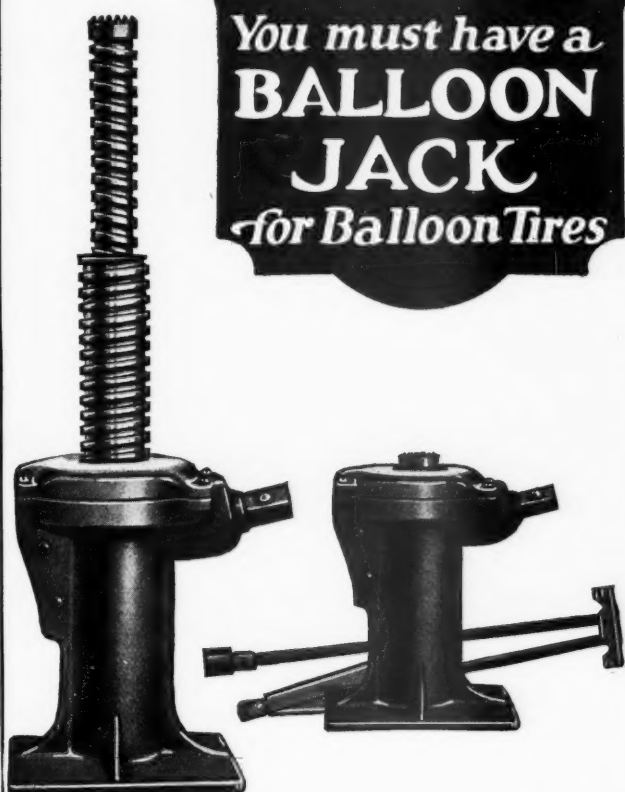
Clamps firmly to the Ford dashboard in a few minutes. Provided with a tape conductor that attaches to the ammeter terminal. The lamp housing is arranged to form a self-contained switch.

A simple, inexpensive accessory that lends driving convenience, sells easily and nets a good margin of profit.

Write today for full details and prices on the Victor Line of lamps and accessories.

**THE CINCINNATI VICTOR CO.**  
714 Reading Road Cincinnati, Ohio





*You must have a*  
**BALLOON**  
**JACK**  
*for Balloon Tires*

*This is the Balloon Tire Jack  
 for you to sell!*

The enormous demand for balloon tires gives you a wonderful opportunity to make good profits on selling No. 7 Reliable Balloon Tire Jacks.

Everybody knows that old style jacks won't work on balloon tires. That makes hundreds of your customers who are equipping with balloon tires, good prospects for the new Reliable No. 7.

The Reliable No. 7 has an extremely low starting height (6 $\frac{3}{4}$  inches) and an exceptional lift (10 inches) to provide sufficient clearance when changing a tire. It works easier and faster than a ball bearing jack, due to an entirely new type of double screw construction. 36 inch folding handle, 4000 lb. capacity, red baked enamel finish.

*Send in your order now  
 Your jobber will supply you.*

Elite Manufacturing Co., Dept. MA-10 Ashland, Ohio

**RELIABLE JACKS**

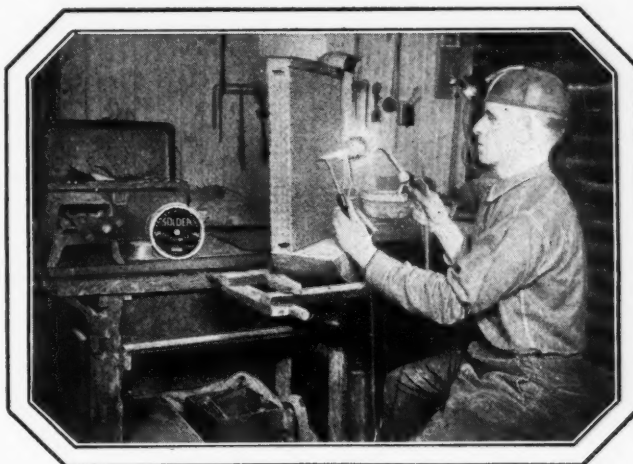
## KESTER SOLDER

*Self-Fluxing*



(Underwriters' Laboratories Inspected)

*"Requires Only Heat"*



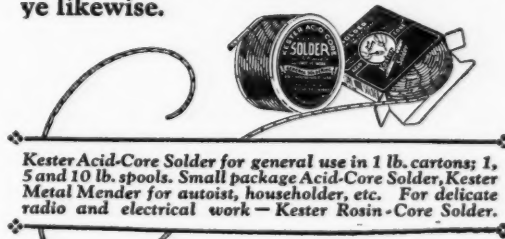
### For Reaching Difficult Spots

**T**HINK of the many "hard to reach" soldering jobs that have taken more time than you've figured. Nobody likes those jobs — yet everybody can handle them quickly and satisfactorily with Kester Solder.

Kester saves time on every soldering job, because it is self-fluxing. Scientifically prepared flux is held in tiny pockets inside this virgin tin and lead solder. Simply apply heat to the job, and as the pockets melt one by one, the exact amount of solder and flux flows right where you guide it.

Old-time mechanics find in Kester a daily dependable necessity, and by its constant use they profit.

Heed the "old timers" advice, and do ye likewise.



Kester Acid-Core Solder for general use in 1 lb. cartons; 1, 5 and 10 lb. spools. Small package Acid-Core Solder, Kester Metal Mender for autoist, householder, etc. For delicate radio and electrical work — Kester Rosin-Core Solder.

Manufactured by the  
**CHICAGO SOLDER COMPANY**  
 4203 Wrightwood Ave.  
 CHICAGO, U. S. A.





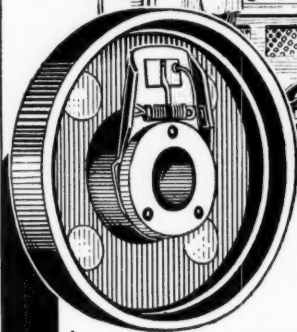
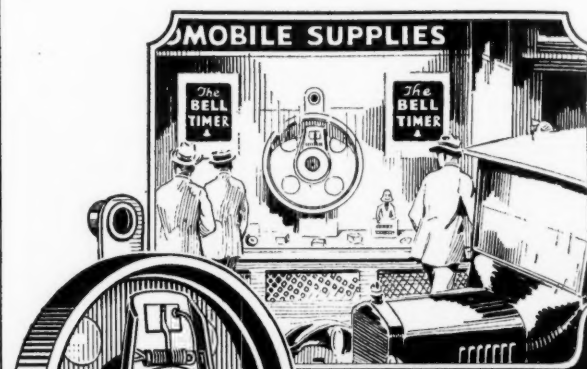
**There's**  
 "something doing"  
 here that will interest every hardware and accessory dealer in the country. Watch for our announcement next month.

## CRESCENT TOOL CO.

208 Harrison St.

Jamestown, N. Y.

*Originators of the Crescent Wrench*



*They  
 Sell*

## The BELL TIMER

*"Built like a High-Grade Distributor"*

Bell Timers are "Best sellers."

They don't stay on dealers' shelves—but they do stay on users' Fords.

There are plenty of reasons for Bell's steadily growing popularity. Bell needs no oiling or attention. Bell has a clean wipe contact; a solid copper brush; solid copper contacts molded into a one-piece Bakelite shell.

Nothing short of a big car's distributor can approach it for smoothness and accuracy.

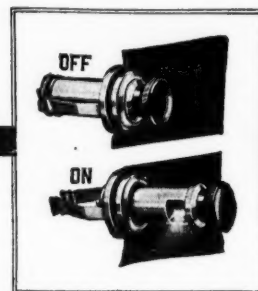
*It pays to sell Bell Timers.  
 Leading jobbers carry them.*

**BELL MANUFACTURING CO.**  
 13 Elkins St.      Boston 27, Mass.

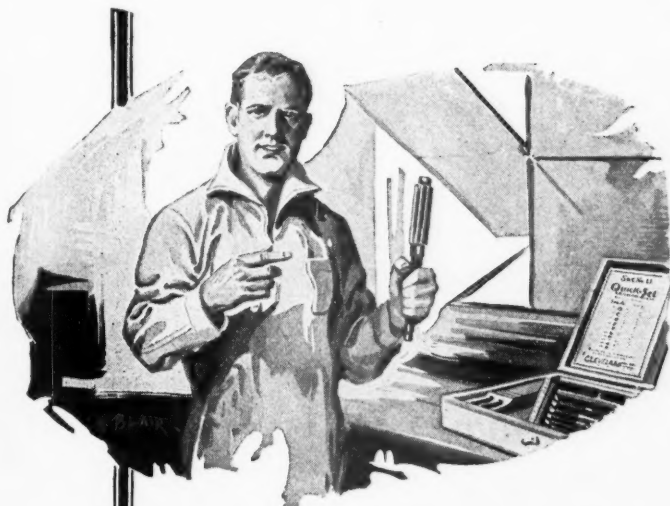
### Makers of the new BELL DASH LAMP

for Fords and other cars. An automatic lamp that is out of the way when not in use.

*Ask your jobber*







## "Here's a thing you ought to know"—

"Before I began to use these reamers, I had enough miscellaneous styles and sizes to stock up a big machine shop. Every time I wanted a particular reamer, in a certain size, that tool was bound to be lost, or broken, or the blades dull. That's an experience I don't want to go through again.

"Now, however, I keep all my reamers in a fine, handsome oak cabinet, each tool in its place, and I know where to look for them. Just eleven reamers take care of every job that comes in—and I could get along with nine, at a pinch. Furthermore, I keep on hand one extra set of blades for each size, which I find is good "Safety First" stuff.

What's the name of the reamer? Why, it's called the

# Quick-Set Adjustable Reamer

TRADE MARK REG. U.S. PAT. OFF.

## Complete Set No. 44

These eleven fine, sturdy, beautifully finished Reamers provide you with an expansion range from 15/32 in. to 1 1/2 in. inclusive. Each Reamer expands to the smallest size of the next larger Reamer, thus eliminating all the odd sizes so many shops think they have to have.

Quick-Set Reamers should not be confused with ordinary adjustable reamers. They are built by a concern with a 50 year reputation in the manufacture of fine tools. The "Cleveland" name stands back of every tool.

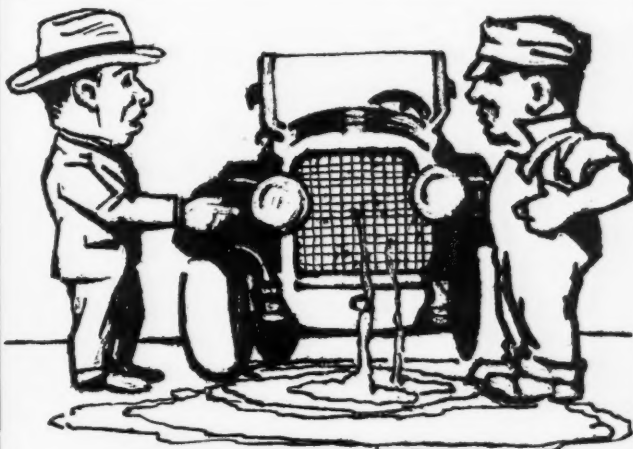


## Ask your Dealer for Quick-Set

Your dealer will be glad to show you the set pictured above, as well as several other convenient sets and individual tools. If he cannot supply you, write us direct.

The **CLEVELAND** TWIST DRILL COMPANY  
CLEVELAND  
NEW YORK-CHICAGO-LONDON

TRADE MARK REG. U.S. PAT. OFF. AND FOREIGN COUNTRIES

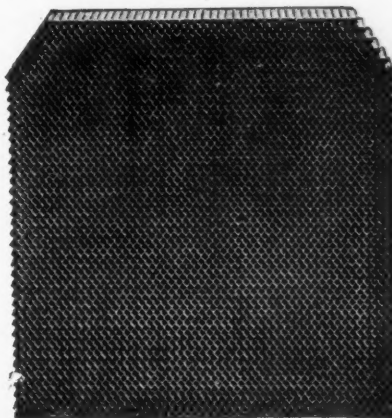


## What do you tell them?

Just what do you say when a man comes in with a radiator, "pretty well shot?"  
"Better let me have it fixed up for you"—or—  
"I can get you a new one in a few days."

Both are lame bids for business, which even if gotten, under such circumstances pays a poor profit. ANY dealer, by handling the new Fedders Shallow Core can make real money on these radiator replacement opportunities.

No need to carry a big stock. Carry a few popular types and order others as needed. 24-hour Service from conveniently located branches makes this possible.



## FEDDERS Shallow Cores

Not only service but real selling features! The Fedders Shallow Core is shallower, lighter and stronger than other replacement cores. Because of its unique construction, its cooling efficiency is unsurpassed. It is freeze-proof—the greatest replacement core ever built.

A BUSINESS opportunity, requiring no tied up capital.

Write today for the details.

**FEDDERS MFG. CO.**  
Buffalo, N. Y.

Branches in Cleveland, Detroit, Indianapolis, New York, San Francisco





# VacuLarm

ON THE INSTRUMENT BOARD  
OF YOUR CAR

- 1 BLOWS THE HORN when gasoline supply falls to three (3) gallons. Repeats this warning when the supply is down to two (2) gallons and again at one (1) gallon.
- 2 SHOWS AMOUNT OF GASOLINE in the rear supply tank in gallons and fractions.
- 3 RED AND WHITE SIGNALS OPERATE AS AN ENGINE VACUUM INDICATOR where many troubles can be located before they become serious, such as obstructions, leaks of air or gasoline and other possible troubles.

Easily installed. No wiring or tubing need be removed or changed.

### MR. DEALER:

Now is the time to show VacuLarm—the wonder instrument—and “ask ’em to buy”. There is a nice margin for you and they sell readily.

There is nothing like VacuLarm—a real meter—positive—and the market is protected by basic patents.

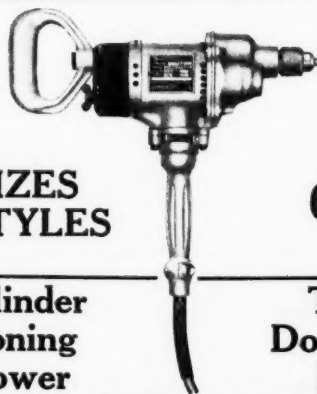
**GUARANTEED:** Money back if returned for any reason within 30 days.

List \$12.50—write for all information and complete instructions.

Manufactured by

**THE SMITH MOTOR EQUIPMENT CO.**

1928 WEST 77th St., CLEVELAND, O.



64 SIZES  
and STYLES

0 to 2"

Cylinder  
Honing  
Power

That  
Does Not  
Lag

**PAY A LITTLE MORE—GET MUCH MORE**

We are not a bit backward about saying that THOR DRILLS cost more than some electric drills but there is a reason for it.

That reason is your assurance that your drill will be a good investment.

There is going to be a tremendous volume of car RECONDITIONING work and we urge you to use the very best tools at the outset.

Write for our new illustrated catalog today

**INDEPENDENT PNEUMATIC TOOL CO.**

600 W. Jackson Blvd. 1463 Broadway  
Chicago, Ill. Branch Offices Everywhere New York City

# Thor

UNIVERSAL  
ELECTRIC  
DRILLS

**A SERVICE SUPERINTENDENT**  
Has just off press his NEW BOOK

## Automobile Repair Manual

By R. E. Lomer



**WRITTEN IN MECHANIC'S  
ENGLISH**

**G**IVES you all shortcut modern methods for repairs on all cars. It covers principles of operations in overhauling the complete engine and chassis, also explains the proper care and use of tools.

Many repairs are explained where special features are involved.

300 Pages, 6x9 ins., 169 Figs., Cloth—\$3.00.

**\$1 DEPOSIT WILL BRING YOU THIS BOOK**

**U. P. C. BOOK COMPANY,**  
239 W. 39th St., New York.

I enclose \$1.00 deposit. Please send me Lomer's Automobile Repair Manual. If it is satisfactory, I will remit the balance of \$2.00 within ten days, or return the book and my deposit of \$1.00 will be promptly refunded.

Name .....

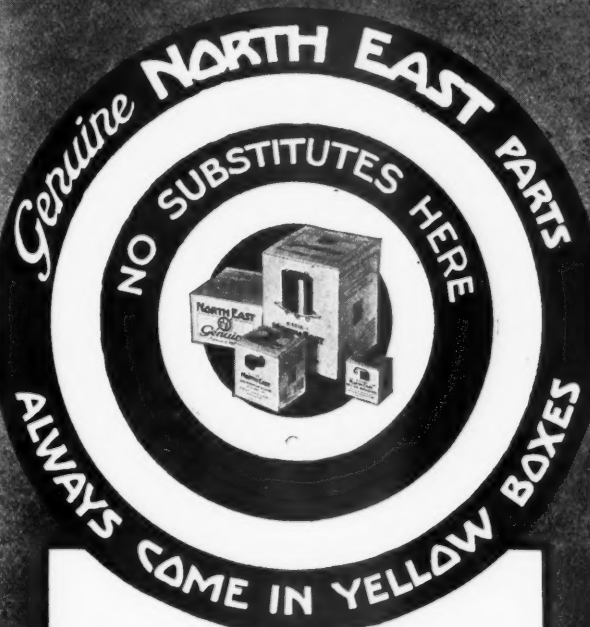
Address .....  
Subscriber to Motor Age.

Sept. 4, 1924.



# NORTH EAST

*Electric Starting Lighting Ignition Horns Speedometers*



THERE is now a way of letting your customers know that you believe in Genuine Service Parts.

The North East Genuine Parts "Bull's Eye" Window Sign helps your customer to find you and tells him you handle only Genuine North East Service Parts.

Authorized North East Service Stations or North East Branches can supply the Genuine North East "Bull's Eye" to their customers whose policies are reflected by it.

## NORTH EAST ELECTRIC CO.

*Manufacturers of Automotive Equipment for*

Dodge Brothers	Reo	Yellow Coach
Fifth Ave. Coach	Berliet	Fay & Bowen
Yellow Sleeve Valve Eng.	White	Four Wheel Drive
Holt Mfg. Co.	Delage	Yellow Cab
Phila. Motor Coach	Leon Bollee	Sterling Marine Engine

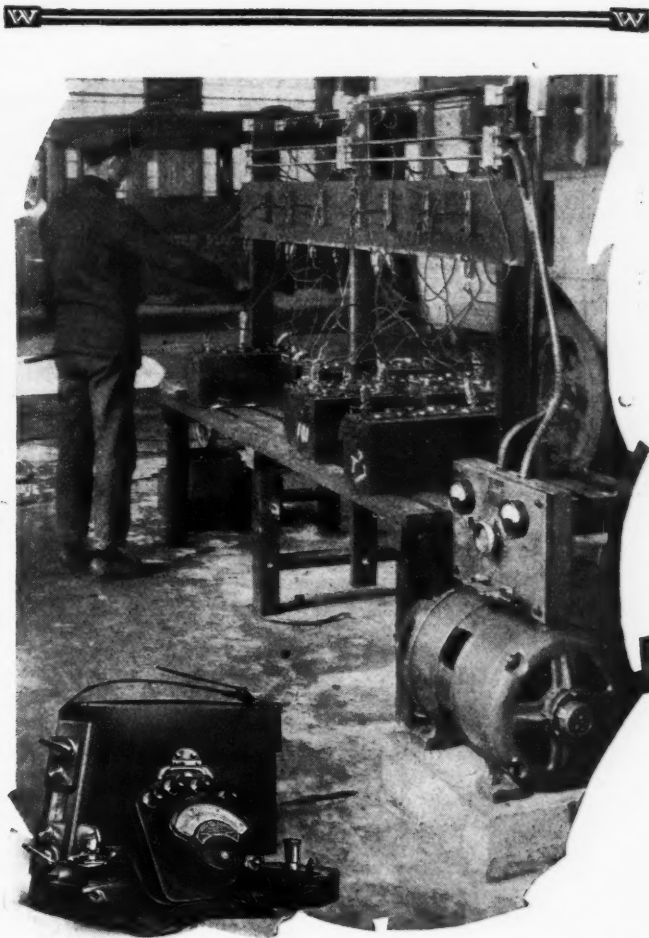
*Official North East Service Organization*

### NORTH EAST SERVICE INC.

Rochester	Kansas City
Atlanta	San Francisco
Chicago	Toronto
Detroit	London
New York	Paris



USE ONLY *Genuine* SERVICE PARTS



## Weston Garage Set — Good for Any Test Required

A miniature precision voltmeter having six ranges, 30, 3 volts, 100 milli-volts and 300, 30 and 3 amperes. Invaluable in locating shorts, grounds, open circuits in starting motor, generator wiring or auxiliaries. Gives rate of battery charge. Tests condition of batteries. Locates defective plates. Measures current required for starting motor, lights, etc. Cadmium tests cables also supplied, if desired.

Send for Booklet H. It illustrates, describes and gives prices of Weston Instruments and accessories for automotive service.

## Weston Electrical Instrument Co.

10 Weston Avenue

Newark, N. J.

BRANCH OFFICES IN ALL PRINCIPAL CITIES

# WESTON

*Electrical Indicating Instrument Authorities Since 1888*

STANDARD—The World Over



## Turn off battered teeth— shrink on the ring

That's all there is to a Meachem Ring Gear installation. Its not hard and it can be done quickly.

The car owner gets a fly-wheel that is stronger and better than new and you make a bang up profit.

Watch for limping fly-wheels—it pays.

*Write for our proposition*

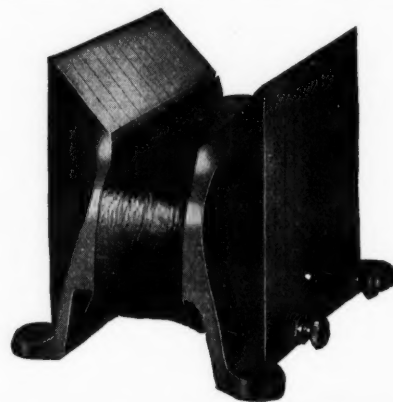
**The Meachem Gear Corp.**

Syracuse New York

**Make  
More  
Money**

FOR FLYWHEELS

# Meachem Steel GEAR RINGS



## This Growler Costs But \$6.50

With it you can tell in ten seconds whether an armature is in good condition. If it is not, you are saved all the grief of having to do the whole job over, losing all your profit and the customers' goodwill besides. Operates on 110 Volt A. C. Current.

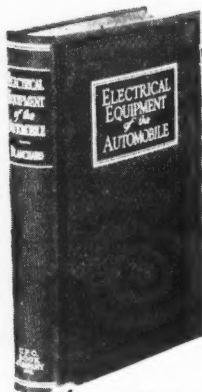
Sold direct or through your jobber. Your check for above amounts plus twenty-five cents postage brings this money-maker to you.

ARMATURES: We rewind any and all kinds of GENERATOR, MOTOR and MAGNETO armatures, and reship same day old armatures received.

FORD GENERATOR AND MOTOR ARMATURES.....	\$ 1.50
ALL SMALL DOUBLE UNIT GENERATOR AND MOTOR ARMATURES.....	5.00
SINGLE UNIT MOTOR GENERATOR ARMATURES.....	10.00
MAGNETO ARMATURES.....	\$3.75 to \$4.75

**Armature Rewinding Co., Inc.**

3301 Washington Blvd., St. Louis, Mo. (1)



## FIND YOUR ELECTRICAL TROUBLES QUICKLY

*Just Published*

### ELECTRICAL EQUIPMENT of the AUTOMOBILE

*By Harold F. Blanchard*

**G**IVES step by step directions for locating electrical troubles on all cars. Classified under symptoms for quick reference such as engine missing—starter trouble—flickering lights—dim lights—battery trouble, and many other troubles that happen daily.

*For reference when "stuck" and for study*

Electrical principles and theory fully explained in simple English. All electrical units described and analyzed.

453 Pages, 6x9 ins., 264 Figs. Cloth.....\$3.50

**\$1.00 DEPOSIT WILL BRING YOU THIS BOOK**

U. P. C. BOOK COMPANY, 239 W. 39th St., N. Y.

I enclose \$1.00 deposit. Please send me Blanchard's Electrical Equipment Book. If satisfactory, I will remit the balance of \$2.50 within ten days, or return the book and my deposit of \$1.00 will be promptly refunded.

Name.....

Address.....

Subscriber to Motor Age.....Sept. 4, 1924



Model G-D

**TEMCO**

**Half-Inch  
Garage Drill**

Price  
**\$56.00**

*"With the Motor that doesn't run hot"*

**What Users Say  
—That's What Counts!**

**Now Read This:—**

"Your Model 'J,' 3/8" Temco Drill has given us the best results of any drill in our plant," writes the Lima Sheet Metal Products Co. of Lima, Ohio, while E. E. Turley of Williamsport, Pa., said: "Your Model 'K,' 1/2" Drill is the best drill we have ever used, regardless of make or price."

Strong words, indeed, but true—and we've many more like them.

*Ask your Jobber about a Temco Drill suited to your need, or write direct for catalog and prices.*

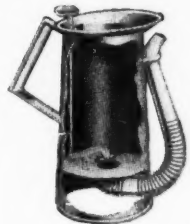
**The Temco Electric Motor Company**

709 Sugar St.

Leipsic, Ohio



## Hold the Confidence of Your Customers



When a customer asks for **medium** oil, **don't** pick up a container previously filled, and empty it into his crankcase. He can't be sure that he's getting what he asks for—and no customer likes that.

Draw the oil from a tank that is marked "**medium**". Let him see it flow into an open Brookins Measure. Then without bothering about a funnel—carry it to his car, insert the Brookins flexible, metal nozzle in the oil port, and press the thumb valve. That's all.

You won't spill or waste a drop. You only make one trip for a quart or a gallon. You'll give him quicker service. And he'll know that he's getting what he asks for.

Made in copper finish in one, two, four and five-quart sizes.

Practically all jobbers carry Brookins Oil Measures in stock. If your jobber doesn't write us for samples and prices. Write for descriptive matter on Brookins Emergency Gas Can and Brookins Instant Price Charts for Gasoline Pumps.

**The Brookins Manufacturing Co.**  
342 Xenia Ave. Dayton, Ohio

**Brookins**  
OIL MEASURE

### Other Brookins Products

**Brookins Price Charts** for service stations cost \$7.50 for a complete set. They pay for themselves many times over.

**Brookins Emergency Gas Can** helps to give the kind of service that every car owner expects. Write for descriptive circular.



*A Radical Departure That Spells Profit for You*

## The NEW K-D DRIVING LAMP

—a real glow light, not a spot lamp.

You know how motorists have been waiting for a lamp of this type. Here it is, built to give plenty of service, and priced to sell with good profit to you.

Fastens on any flat surface of car and is practical on any make of automobile.



Nickel and black combination in drum type.

### No. 200 STOP LAMP

The moment the brake is applied, the clear amber lens flashes the word "Stop". This lamp is far in advance of the ordinary stop-light—prove it to your satisfaction. The price is very low so you can get the advantage of volume business.

Made in one piece from suitable gauge steel, black enamel baked on. Brass door, polished and nickel plated. Special amber lens showing "stop" when brake is applied. Enclosed type switch. Packed in individual cartons.



FOR ATTACHING TO FENDER



FOR ATTACHING AROUND TAIL LAMP

Includes two sets Brackets

**The K-D Lamp Co.**  
Cincinnati, Ohio

## Which Man Would You Hire?

Supposing you could hire two men, one at 40c an hour and the other at 60c an hour. If the 60c man could do double the work of the 40c man he'd be the cheaper man for you to hire.

It's the same with rim tools. The Pacific costs more than some tools but it absolutely is guaranteed to turn out more work for you in less time. Besides it protects you from springing a rim or causing damage of any nature.

List Price **\$10.00** —worth more

## PACIFIC RIM TOOL

### Pacific Rim Tool Co.

16606 Waterloo Road, 2339 11th Ave., N.  
Cleveland, Ohio Seattle, Wash.

Export Office  
1834 Broadway,  
New York City



## It Pays to Buy a Kellogg



New Kellogg Air Tower

Attracts Motorists night and day. Air and water service combined. Price only \$60.00 net.



### Give 'em Air!

That's what they want—and that's why they go to the place with steady, dependable Kellogg E. M. 62 Compressor on the job.

The E. M. 62 is made especially for a big place like yours—it gives plenty of good, clean air right along—it never falls down on the job.

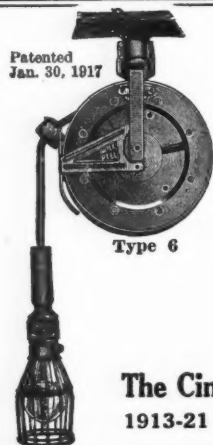
Want us to prove it? Send us a card.

**KELLOGG MANUFACTURING CO.**  
ROCHESTER, N. Y., U. S. A.

New York: 112 West 42nd St. Chicago: 1502 Monadnock Bldg. San Francisco: 1183 Bush St. Cleveland: 1108 Hippodrome Bldg. Dallas: 2006 1/2 Commerce St.

## Beyond Compare for Pumping Air





Patented  
Jan. 30, 1917

Type 6

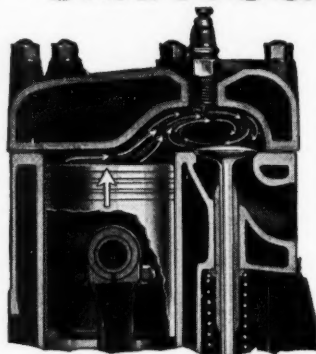
## Autex Extension Reel

Takes light where wanted. Cord locked at any desired point and rewound automatically on reel when not in use. Used in all places where extension of either light or power is required, eliminating the inconvenience and danger of loose cord extensions.

Approved by Underwriters

The Cincinnati Specialty Mfg. Co., Inc.,  
1913-21 Powers St., Cincinnati, Ohio

## The Ricardo Head

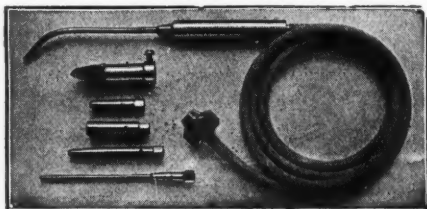


Mass response followed the announcement of four-wheel brakes and balloon tires. Now, the car-buying public looks for improved engine design—increased performance at lower cost and the new standards of ease and certainty the Ricardo Head provides. Thus, immeasurable sales value is added to the product that's "Ricardo Head-equipped."

**WAUKESHA**  
Motor Company  
ENGINE BUILDERS  
Waukesha, Wisconsin  
New York, N. Y.

## THE BEST TOOL IN THE SHOP!

Every  
garage  
needs  
one



Handy  
for the  
small  
jobs

Every purchaser of TORIT ACETYLENE TORCH No. 13 says it beats anything they ever saw. We guarantee it. USES NOTHING BUT ACETYLENE. Simply connect to Presto tank, light gas, and the outfit is put to work.

Complete as above, with connection for Presto auto tank, and full instructions.  
\$7.50 in U. S. A. \$10.00 in Canada

Order from your Jobber's salesman, or

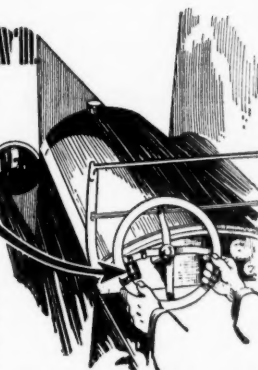
ST. PAUL WELDING & MFG. CO., 169 W. Third St.,  
St. Paul, Minn.

## Instantdim

Neat and Convenient

Always easy  
to dim

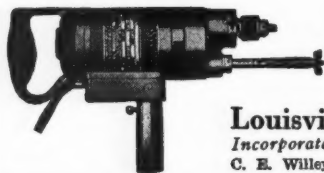
Simply press the toggle type switch on the steering wheel. Keep your hand on wheel, eyes on road and foot on pedal. A much needed protection and convenience for all motorists. Style "A" for Headlights, \$2.25—"B" for Headlights and spotlight, \$4.25. No complicated moving parts. Attached in 15 minutes. Sell this necessity at a good profit. Write NOW for discounts.



H & H MFG. CO.  
BUCYRUS, OHIO

## 'Get This "Pioneer" \$65 Garage Special

Electric Drill  
and Valve Grinder



Greatest time and money saver, as well as money maker, for your shop—

"It Will Do The Work"

Louisville Electric Mfg. Co.  
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C. E. Willey, Pres. J. B. McFerran, Secy.-Treas.

## Jack—For Balloon Tires



Patent  
Applied  
For

The Springfield Jack No. 9 especially designed for balloon tires—

Double Screw—Ball Bearing Low Placement—High Lift Height when closed, 7 inches Extends to 17 inches.

Convenient handle excellent workmanship and quality.

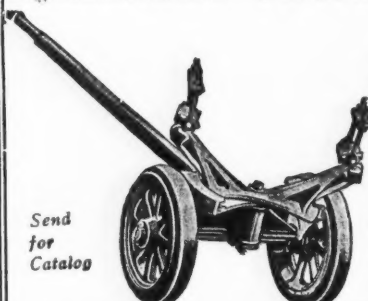
Dealers—Jobbers—Write us for discounts

**THE SHAWVER CO.**  
Springfield, Ohio

Weight 8 pounds  
Capacity 1 ton  
Price \$4.75

## MANLEY TOWING TRUCKS

Send  
for  
Catalog



Manley Towing Trucks have 100% efficiency for bringing in disabled cars. The Double Post construction straddles the differential and takes the weight off both wheels, making it possible to use the truck if both wheels of the car are damaged, if it has a locked differential or the axle is crosswise. Under these conditions a Single Post tool is useless. Radial Race Ways support the car next to the wheels, massively built of

heavy Malleable Steel throughout and 2" telescoping tongue. Roller Bearings are hardened, 100% road clearance. The finest perfection in a Towing Truck.

MANLEY MFG. CO.

YORK, PA.

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It handles an important part of your cylinder work. Takes all sizes of cylinders from 2 3/4 to 8". The deep, heavy, wide faced stones on the Storm Hone mean longer life, faster cutting and smoother finishing as well as freedom from chatter and stone breakage. Complete and with extra equipment only \$40.25.

Write for the Storm Book, "Modern Cylinder Methods"

**STORM Mfg. Co.**

406 A Sixth Ave. So.  
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You get quality work, SAE specification materials, and the right price if you send your connecting rods to a Watkins plant for rebuilding and refuse imitations of



New bolts and nuts, laminated shims, new piston pin bushing are part of the rod rebuilding at no extra charge. New Bearing tinned in the rod and broached to mirror finish fits quickly to crankshaft and cuts time on flat rate repair jobs. Practice sending your rods in regularly. There's profit in it.

## WATKINS Complete REBABBING SERVICE

"One Day Service from factory nearest you"

Chicago, Ill., Berguson Skinner Corporation.  
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St. Louis, Mo., H. & H. Machine Co.  
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Syracuse, N. Y., Watkins Mfg. Co. of New York  
Toledo, Ohio, Stewart-Burgan Co.  
Washington, D. C., R-L Motive Parts, Inc.  
Waterloo, Ia., All States Rebabbing Service  
Wichita, Kans., Home Office, The Watkins Mfg. Co.

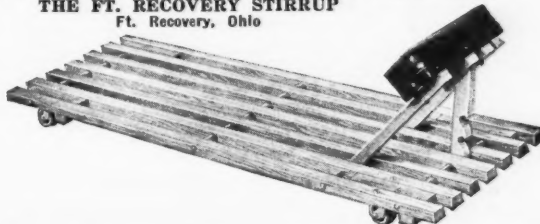
## "Koch Kreepers"

Support the head in three different positions while working under the car. Eliminate body fatigue and neck cramps. Head rest is padded and can be adjusted to any position by slight pressure of hand while worker is on creeper under the car.

Sturdy and durable. Will last indefinitely. Universal steel wheel casters—ball bearing swivel.

Made in three grades. No. 3—13½ in. wide by 40 in. long. No. 2 same as No. 3 except head rest is not adjustable. No. 1—36 in. long and a cheaper creeper but wonderful value for the money. Fine for car owner. Write for complete details.

THE FT. RECOVERY STIRRUP  
Ft. Recovery, Ohio

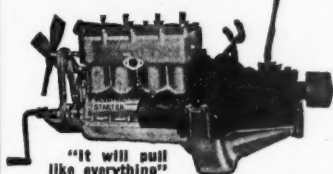


## MORE POWER

Replaces the regular Ford Transmission  
**SIMPLEX 3 SPEED**  
Sliding Gear Type

For Ford Cars and Trucks

26 to 1 in low in our new type "CT"



"It will pull like everything"

Have three speeds forward and one reverse, replacing the regular Ford transmission—drums, bands and all. The low speed is lower than the Ford, therefore, more power—the third is the same as the Ford and the second is half way between. It's ruggedly built with oversize alloy steel gears. Multiple disc clutch. Foot brake on jackshaft outside of case. Hyatt Roller and Genelite bearings. No cutting or machining—installation easy.

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FULLBACKS look good on every sort of car—\$14 to \$25

"No matter how you damage your BETTER bumper, we will repair it or give you a new one free," is that lifetime guarantee that goes with every New Era BETTER bumper. And it has been going with them for eight years.

NEW ERA SPRING & SPECIALTY CO., GRAND RAPIDS, MICH.



VLCHEK WRENCHES

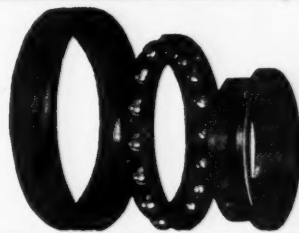
SHAPED and tempered jaws stand any strain without snapping or opening up. They turn any nut that can be turned. Bar designed for unusual hand comfort. Forged from special steel. Finished as desired. Send for Catalog

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EASY TO SAY VLCHEK

**VLCHEK TOOLS**

MADE BY THE WORLD'S LARGEST PRODUCERS OF TOOL KITS



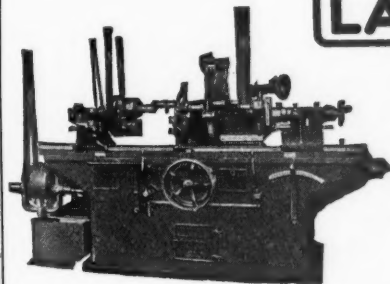
The Bearings Company of America  
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Angular Contact Radial Bearings—Angular Contact Thrust Bearings—Thrust Ball Bearings—"STAR" Ball Retainers for Thrust, Magneto, and Cup and Cone Bearings.

Your inquiries are solicited

Western Sales Office,  
1012 Ford Bldg., Detroit, Mich.

## LANDIS



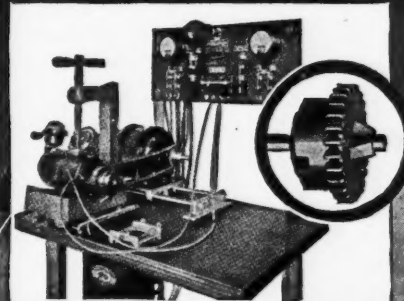
The LANDIS 4-A Special GARAGE Grinding Machine is built ESPECIALLY for repair shop work. You don't need a manufacturing machine—don't get one. The 4-A Special is perfect for repair shops. Quick and easy change from job to job. Simple to operate. ACCURATE. Built by world's largest makers of grinding machines. More value for your money. Catalog.

Landis Tool Co., Waynesboro, Pa.

New York Office—30 Church St.

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With the Positive Drive and Speed Control



**INCREASE YOUR PROFITS!**  
Starting, lighting and ignition pays bigger profits than any other branch of automotive service.

**The Excelsior Test Bench**  
equips your shop complete for this work.

**Price \$385.00**  
Payable \$50 per month  
Write for bulletin 975M

**WEIDENHOFF** 4350 ROOSEVELT ROAD  
CHICAGO, ILL., U.S.A.



Isolators  
Lock  
Plates.  
An  
Exclusive  
Vesta  
Feature



### As Old As The Auto Industry

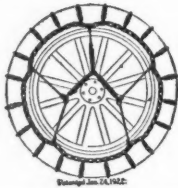
Vesta has 27 years of experience built into it. The isolators have been used for 8 years. Always in keeping with automotive requirements. Write for our proposition.

Vesta Battery Corporation  
Chicago, Ill.

## ECLIPSE Safety SHADE

Instantly adjusted to any desired shading position with one hand from driver's seat. Makes night driving safe. One size for all cars. Write at once for our plan of distribution and full details.

SUBURBAN TRANSIT CO., Plainfield, N. J.  
Subsidiary of Spicer Mfg. Co.



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### IMPROVED ANTI-SKID CHAIN TIGHTENER

#### Helps Chain to Creep While Taking Up the Slack

An exclusive sales feature!

Retail Price, \$1.00 Pair.

Dealers—Jobbers—Write—Discounts Liberal.

ELECTRIC PARTS CORP.

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## Mosler SPIT FIRE Spark Plug

The Plug with the Red Top

Red protector cap eliminates any form of accidental porcelain breakage. Serves every car on the market with six sizes. Smaller Investment—Quick Turnover—No Sizes that "Stick". Lower Prices.

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Manufacturers Mosler Spit Fire Timers



## Noiseless Timing Gears

Install quietness—Cloyes NOISELESS Timing Gears. They give the motor a soft, even "purr"—permanently.

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Sales Representatives

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## Racing FORDS

Write today for pamphlets and LOW PRICES covering Power-Plus Cylinder Head. Aluminite Racing Pistons and Connecting-Rods, High-Speed Camshafts. Rebuilding ALL MAKES of cars for racing a specialty. Nine years' experience.

GREEN ENGINEERING CO., Dayton, O.



\$5

## Wood-Imes

Water Circulating Pump  
For Ford Cars and Trucks

Is as reliable as the Ford Car itself and assures a positive cooling system that constantly functions. No more overheating—No more freezing in travel—Made engineeringly correct of best materials—quickly and easily installed. Write for Dealer Discounts and complete information.

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Formerly Mid-West Mfg. Co.

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### CYLINDER REBORING MACHINE & VALVE GRINDER

WAYNE TOOL MFG. CO., WAYNESBORO, PA.

Be equipped with these two efficient machines to render good service on cylinder reboring and valve grinding jobs. Save time and labor and get more profit.

Write for details.



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Adjustable. Two sizes will clamp any hose of any diameter. Made from cold rolled steel out of wire. No rough edges to cut hose. Put on in less than a minute. Everlastingly leak-proof. Order Universal Hose Clamps. Trademark on every clamp and carton. Get them from your jobber—or write us.

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## DO MOTOR RE-CONDITIONING AND EARN BIG MONEY!

You can ream and hone an average cylinder block the factory way in fifty minutes. Do the work without removing the engine, quickly, efficiently and economically. All you need is

FOSTER-JOHNSON Re-Conditioning Equipment

Cylinder and Piston Reamers, Hones, Kylin General Purpose Reamers and Reamer Sharpeners, all included.

Write for Foster-Johnson Station Manual and Tool Catalog

FOSTER-JOHNSON REAMER CO.

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## QUALITY—PROFIT—TURNOVER

American  
Hammered  
Piston Rings

American Hammered Piston Ring Company  
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## Jacobs ROAD-LITE

Lights the way to safety

Lights up the right hand side of road 60 to 70 feet ahead. Can't shine in other fellow's eyes. Invaluable for night driving.

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R & C Oiler comes in 30 ft. rolls. One roll will equip from 6-12 cars. Installed with pliers in few minutes. Real dealer opportunity. Good profits. Write. Exclusive distributors wanted.

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## ALMOND "STRAIGHT LINE" DRILL CHUCKS

When buying Portable Electric Drills be sure to look for the distinctive ALMOND CHUCK, which may be easily identified by the "STRAIGHT LINE" milling on the chuck body.

Write for complete information regarding the new ALMOND "STRAIGHT LINE" CHUCKS.

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OVER 100 ACCURATE SHORT-CUTS  
TO GOOD WILL AND PROFIT ~ ~  
Thru your jobber—his service is economy

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## Lorentzen Headlight Kontrol

AN AUTOMOTIVE  
NECESSITY THAT SELLS

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## Night GUIDE

*the Super Spotlight*

**FITS  
THROUGH  
THE  
WINDSHIELD  
GLASS**

Fyrac Mfg. Co.  
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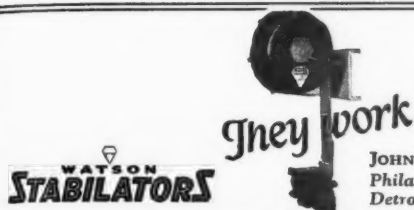
### The 100% Lubricants

Guaranteed not to cake or harden or to contain any Moisture, Mineral or Fatty Acids. Attractive proposition for Jobbers and Dealers.

**RADIANT OIL CO., Inc.**  
Manufacturers and Compounders

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Kokomo  
TIRES AND TUBES**

Kokomo Long Life tires and tubes make money for dealers who handle them.

Kokomo Twin-Grip Fabrics  
Kokomo Two-Grip Cords  
Kokomo Everlaster Red Tubes  
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**KOKOMO RUBBER CO., Kokomo, Indiana**  
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**NO-LEAK-O PISTON RINGS**  
Won't Leak Because They're Sealed With Oil

No-Leak-O Piston Rings are making money for dealers everywhere. Their "oilSEALing" groove—found only in No-Leak-O—packs an oil film in between piston and cylinder walls like "packing" in a pump. Oil and gas stay where they belong. National advertising is helping the dealer sell No-Leak-O. It will pay you to stock No-Leak-O at once.

Price 35c and up

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### "OIL CONTROL" PISTON RINGS

The Motor Necessity That Has Made Good  
Backed by Seven Years' Satisfactory Service  
**THE WEL-EVER PISTON RING CO., TOLEDO, OHIO**  
Sold most everywhere. If your dealer cannot supply you write us.

### Send U. S. Your Armature Repair Work

**FORD  
ARMATURES  
REWOUND**  
\$2.00



**MOST ANY  
TWO UNIT  
GENERATOR  
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**ALL WORK GUARANTEED—WRITE FOR PRICE LIST**  
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The Custom Built Car



The Aristocrats of Motordom

7 Models—Open and Closed  
Distributors in principal cities. Open territory now being closed.

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### We Make RADIATOR CORE EQUIPMENT

For the Complete Manufacture of  
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Ask Us About This Equipment

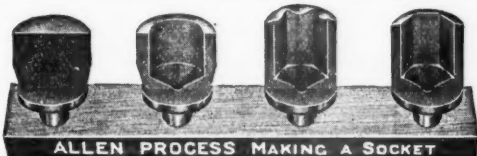
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ALLEN Wrench Sets

**The Allen Manufacturing Company, Hartford, Conn.**

**2WAY  
HYDRAULIC  
SHOCK  
ABSORBERS**

Controls the springs both ways—up or down. The greater the shock the greater the hydraulic force—a smooth, even force that absorbs all shocks. The 2-Way gives great and lasting satisfaction. Owners are Boosters. Our franchise will make you money. Write for particulars.

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VALVE SPRING COMPRESSOR

The most efficient Valve Spring Compressor and Holder. Saves time and temper. Fully guaranteed. Printed matter on request. Get it! \$7.25 C. O. D.

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Manufactured by Waterloo Valve Spring Compressor Co.



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## MOTOR CARS

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Racine Wisconsin




Thirty-seven  
**BRANCHES**  
**AHLBERG BEARING COMPANY**  
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**Biflex** Cushion Bumper  
for every car




"PROTECTION  
WITH DISTINCTION"  
**THE BIFLEX CORPORATION, Waukegan, Ill.**





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**BRAKE LININGS and CLUTCH FACINGS**  
Always used where safety and service are the first and only consideration.  
KELSO M'FG CO., TRENTON, N. J.



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Chas. W. Rice can help you sell your cars by adding to their appearance and comfort with a set of window blinds, one rear and two side, at a cost of \$15.00 with liberal discount to dealers. We use either fine quality silk or washable fabric in colors that harmonize with upholstery. Shades are mounted on metal rollers complete with nickel plated brackets, ready to install.




Send us name, model, year of car and the exact glass measurements. If you advise us of your probable monthly requirements, we can assure prompt delivery when needed. Write today for details and samples.  
CHAS. W. RICE & CO.  
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"The only oil ring with a mileage guarantee"  
"Sav-Oil" is stamped on bottom of every ring  
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### 140 Combinations

—all in this ONE set  
Everything you need, in one small box, compact, accessible, and a real mechanic's outfit. Sockets will not break. Fully guaranteed. Ask your dealer or write us.  
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Plastic Metallic Packing  
Patented  
Stops the leaks in automobile water pumps. Mold it with your fingers. Makes a smooth metal bearing—adjustable and practically frictionless. At your Jobbers—Get it today. It does the trick. Put up in 1 lb. cans. If your Jobber doesn't carry it, write us direct. Price \$1.65 per pound, f. o. b. Conneaut, Ohio.  
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Let us send you our FREE Catalogue on

## Huetter's

Fly-Wheel Gear Bands  
Huetter Machine & Tool Co.  
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### BUTLER SPRINGS AND THE ACE OF CLUBS ALWAYS WIN

Butler Springs are made of very fine grade steel. They are carefully heat treated and tested for hardness and strength.  
Order your Ace of Springs today.  
**BUTLER AUTOMOTIVE SERVICE CO.**  
101 D. ST. EASTON, PA.



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INSIDE THE WINDSHIELD—NO GLASS TO CUT  
INSHIELD \$ 4 1/2 in. diameter. Heavy Nickel or Black Enamel. Made of heavy sheet brass. 21 c. p. Mazda precision type tipless bulb, silver, triple-plated reflector \$7.50  
INSHIELD SENIOR 5 1/2 in. diameter. Nickel finish only. Simplest and best inner-controlled driving light made. \$10.00  
The Inshield Products Co., Toledo, Ohio  
Formerly the Thal & Bitter Machine Co.  
Patented Oct. 30, 1923

## FISK TIRES

There's a Fisk Tire of extra value in every size, for car, truck or speed wagon

**\$2.00** Retail

### Life Timer

for Fords  
Needs no oil. Short proof. Fool proof. Wipes a perfect contact regardless of wobble in the shaft. Bakelite Commutator is reversible, giving 2 timers for the price of one. Sold through the jobber. Write for folder and discounts.  
**Mechanical Production Co.**  
MILWAUKEE, WIS., U. S. A.



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### USE THE AMMCO

Cylinder Re-Conditioning Tool  
Regrinds and refinishes cylinder bores. It is self-adjusting, self-aligning and self-centering. Write for Bulletin.  
**Automotive Maintenance Machinery Company**  
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Metal-Melting Soldering Heat-Treating  
**JOHNSON GAS APPLIANCE CO.**  
Cedar Rapids IOWA  
Pacific Coast Repr., C. B. Babcock Co., San Francisco, Calif.  
New York Office—277 Lafayette St.

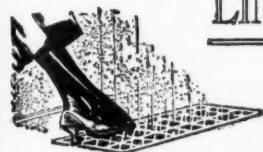
"The Best-Equipped Shop Gets the Business"



### TAKE THE END-PLAY OUT!

—WITHOUT PULLING THE MOTOR  
THE C. A. ADJUSTABLE-CENTER BEARING CAP corrects Ford crankshaft end play and sets magneto for highest efficiency without removing the motor. Easily and quickly installed. Guaranteed for one year. List price \$3.75. Ask your jobber or dealer or write us direct.  
Pat'd 7-22-'22  
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**LINENDOLL EXHAUST HEATER**

Attractive in appearance, with cleaning features of removable heating coil with no connecting joints inside the heater pan to leak. Meets instant approval. No odor or noise. Easily installed and operated. Will boost your winter sales—get our attractive trade proposition.

THE NORWALK AUTO PARTS CO.  
Norwalk, Ohio

**RAMCO CUSHION INNER RINGS**

fit behind piston rings and keep them in perfect contact with the cylinder walls at any motor speed or temperature.

RAMSEY ACCESSORIES MFG. CORP., ST. LOUIS, MO.

FOR ALL MAKES of MOTORS

STANDARD OVERSIZE or SPECIAL

**TRINDL**

QUALITY PISTON PINS and WARP PROOF VALVES

Write us for name and address of jobber nearest you.

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SUPER WARP PROOF VALVES (PATENTED)

**MONOGRAM ORIGINAL SELF LOCKING RADIATOR CAP**

GENERAL AUTOMOTIVE CORP., 600 W. Jackson Blvd., CHICAGO

Now offering both the matchless Peerless Eight and the Superb Peerless Six

**PEERLESS****GF Allsteel**

The Complete Line of Office Equipment

THE GENERAL FIREPROOFING CO., Youngstown, Ohio

**Bosch**

Bosch Franchise details will be sent to any Distributor or Service Station on request.

ROBERT BOSCH MAGNETO CO., INC.  
Otto Helms, Pres., 109 West 64th St., New York

**"In Stock - Not Over a Day Away"**

Write Milwaukee Die Casting Co., Milwaukee, Wis., for name of one of our 500 distributors nearest you.

**MILWAUKEE BEARINGS**



CRANK PIN RE-TURNING TOOL



The Auto Hone Co., Buffalo, N. Y.

Over 110,000,000

**TIMKEN Tapered ROLLER BEARINGS**

Have Been Manufactured

YOU can handle this body PROFITABLY

**HYMAN PRESSED BODIES**

THE HYMAN PRESSED BODY CO.,

All steel construction provides lightweight with extreme strength. Outlast chassis. One design fills most light truck user's requirements. Ton and Half-ton sizes. Shipped knocked down. Low priced. Distributor and dealer terms liberal. Write.

Huntington, W. Va.

**Kawneer SOLID COPPER STORE FRONTS**

Write for Special Book Garage Fronts

THE KAWNEER CO., 1219 Front St., Niles, Mich.

Have you seen the new Gilmer Fan Belt?

It's a V shaped belt, constructed of tough fabric and a new special rubber compound. Sizes for all popular cars using V or grooved pulleys. Write for prices and complete information.



L. H. Gilmer Co.  
Philadelphia

"It's a Gilmer Product—you can depend on it."—Happy Van, the Gilmer man.

**Gilmer**

**KING QUALITY**  
ALL THE NAME IMPLIES

STEERING KNUCKLE BOLTS AND BUSHINGS  
PISTON PINS—PISTON PIN SET SCREWS  
KING MANUFACTURING CORPORATION  
BUFFALO, N. Y.

**Yes!**

Outperforms any car in its class

**GARDNER**

BUILT BY THE GARDNER MOTOR CO.—BUILDERS OF VEHICLES SINCE 1882

**BATTERY SERVICE EQUIPMENT!**

**UNITRON Rectifier**

**PORTOSTAT Test Set**

FOREST ELECTRIC COMPANY

New and Wilsey Streets

NEWARK, N. J.



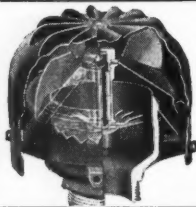
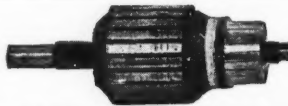
**DON'T**

Turn Down a Rewind Job  
Send it to us. We are "Armature  
Winding Specialists."

Profit for you in our service—Ford generator armature rewind—  
\$1.95. Other prices in proportion. All work guaranteed. Write  
for catalog and prices on all generators.

H. M. FREDERICKS CO.,

Lock Haven, Pa.



**Make the Air Cleaner  
Profits in Your Community**  
**UNITED MFG. & DISTRIBUTING CO.**  
9707 Cottage Grove Ave., Chicago, Ill., U.S.A.  
Wm. E. Kemp, 245 W. 55th St., New York City  
New York and New England Distributor  
**THE UNITED AIR CLEANER**  
*Dustless Air to the Motor*

**Buick Continues Hall Endorsement**

After using Hall Hones for over one  
year Buick test out the New Hall Hone  
and approve of it. It is the only Hone  
endorsed by Buick.

**THE HALL CYLINDER HONE CO.**  
435 Dorr St., Toledo, Ohio

**PERFECT PERFORMANCE**

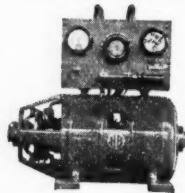
The remarkable showing of the three Fronty-  
Fords in the 500 mile race was due solely to  
the Frontenac Cylinder Head. This head is  
adapted for use on YOUR Ford by its de-  
signer and builder, Arthur Chevrolet. Book,  
"How to Build a Fronty-Ford," \$2; free with  
orders of \$50 or more. Write for FREE catalog.

**CHEVROLET BROS. MFG. CO.**  
410 W. 10th St. INDIANAPOLIS, IND.

**8 Hour Constant Potential Battery Charging Pays Big!**

You can make \$150 to \$300 monthly with HB 8 Hour  
Battery Charging. \$35 cash brings you complete HB 8  
hour charging outfit. Thirty day free trial. HB pat-  
ented Internal Voltage Regulator absolutely prevents re-  
versing. Saves current. Start now to make big profits  
with HB 8 Hour battery charger. Write today for free  
bulletin. **HOBART BROS. CO.,** Box AR 44, Troy, Ohio.

Small Cash Investment—Increased Profits Carry Balance



**Pedrick**  
HEAT-SHAPED  
**PISTON RINGS**

Heat shaped to in-  
sure perfect round-  
ness, sold at almost  
the price of a snap  
ring.

Wilkens Mfg.  
Company  
15th and Mt. Ver-  
non St., Philadel-  
phia, Pa.

**THE QUINCY SILENT AIR-MASTER**

*The Most Air Per Dollar Cost*

**WALL PUMP & COMPRESSOR CO.**

Quincy, Ill., U. S. A.

Styles for all Cars

**Gemco**  
**BUMPERS**  
Write For  
FREE CATALOG  
No. 31



Made by World's Oldest  
Bumper Manufacturers

**GEMCO MFG. CO.**  
742 So. Pierce St. Milwaukee, Wis.

**RieNie**

**RADIATOR HOSE**

Resists the action of hot and  
cold water, anti-freeze solution  
and oil.  
One of the well known Rie Nie  
Products. Manufactured by

**DURKEE-ATWOOD CO.**  
MINNEAPOLIS, U.S.A.

**Real High Tension Ignition  
for Ford Cars**

Varley coils eliminate nearly all chronic ignition  
trouble. Save gas. Add power. Keep plugs clean.  
Stop misfiring. Save repairs. \$2.50 each. Write for  
full particulars.

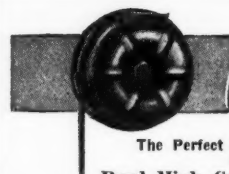
**The Autocoil Co., Jersey City, N. J.**



Spring-steel, Oil-tempered Bumpers in Six Complete Styles. Guar-  
anteed Satisfactory Attaching Arms for all Leading Makes of Cars.

*We invite comparison in appearance, quality and price.*

**THE BELLEVUE MANUFACTURING CO., Bellevue, Ohio**

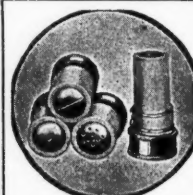
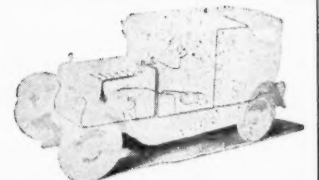


**BURD**  
**GILMAN**  
**SHOCK ABSORBER**

The Perfect Snubbing Device with the Steel Cable  
Distributors Everywhere  
**Burd High Compression Ring Co., Rockford, Ill.**

**Packard**  
**Cable**

**The Packard Electric Co.**  
Warren, Ohio

**The "Big Four"**

A complete car  
washing service.  
**RUBBER COVERED—IMPOSSIBLE TO INJURE CAR.**  
Used in connection with our Little Giant Water Savers,  
or can be applied to any 1/2 in. or 3/4 in. valve.  
Rubber Nozzle—for full water flow.  
Spray Nozzle—for general purposes.  
Spout Nozzle—for cutting mud from fenders, etc.  
Slot Nozzle—a sheet of water covering a large surface  
with force.

**PRICE**—Set of four Nozzles, \$2.00 less dealers discount  
**The Gaylord Manufacturing Company**  
Paterson, N. J.

**The MINUTE \$2.50**

Greatest clock value ever offered the trade.  
Accurate—handsome. Protected against vibra-  
tion. Regulated without dismantling dash.  
Great seller. Price in Canada \$3.50.

**The LUX CLOCK MANUFACTURING CO., Inc.**  
Waterbury - Connecticut - U.S.A.



**PARAFLECTOR**

At last—a headlight reflector that makes night driving safe.  
*Write for full details.*

**The PARAFLECTOR CO., Minneapolis**



# The Broadcaster

A Department that will Find What You Want

If you don't find what you want here,  
your advertisement here will find it  
for you

## PARTS and REPAIRS

## We've Got Everything

In New and Used Auto Parts, Accessories and Supplies, for all makes and models of cars.

Engines; Transmissions; Clutches; Axles; Wheels; Rims; Tires; Radiators; Gears; Axle Shafts; Bearings; Magneto's; Starters; Generators; Coils; Batteries; etc., etc.

Ours is the largest stock of its kind in the world.

## Warshawsky & Co.

World's Largest Replacement Parts House  
1914 So. State St. Chicago, Ill.  
No Branches Ph. Calumet 7315 No Branches

## HOUSE OF A MILLION AUTO PARTS

THE LARGEST STOCK OF NEW AND USED CAR AND TRUCK PARTS IN THE WORLD. WE HAVE EVERYTHING.

New and Used Motors, Gears, Axles, Bearings, Springs, Magneto's, Generators, Clutches, Starters, Universal Joints, Radiators, Cushions, Wheels (Wood, Disk, Wire), Carburetors, Piston Rings and Pins, etc.

Always mention model and serial number in order.

Write us. All inquiries answered promptly

DOUGLAS AUTO PARTS CO., INC.  
2003-5-7-9 South State St. Chicago, Ill.

### DOWMETAL PISTONS

Lighter, stronger, and longer wearing than aluminum or iron. Can be fitted with bronze bushings in the wrist pin holes same as in iron pistons. Dowmetal has no permanent growth. The expansion is little more than iron.

SEND FOR PARTICULARS  
LAMMERT & MANN CO.  
Cylinder and Crankshaft Grinding  
218-21 N. Wood St. CHICAGO Phone West 4918

## AUTO PARTS

SAVES 50% TO 75% ON ALL CARS  
New and Used Gears—Springs and Axles—Cylinders—Motors—Rear Systems, etc. Wire or White

INDIANA AUTO PARTS CO.  
118-18 NO. ILLINOIS ST. INDIANAPOLIS, IND.  
LARGEST CAR WRECKERS IN INDIANA

ANY PART for ANY CAR NEW or USED  
Send for Catalogue  
Cincinnati Auto Parts & Wrecking Co.  
712-714 Walnut St.  
CINCINNATI, OHIO  
Parts our middle name

## INFORMATION

**Six cents a word** is the rate for all undisplayed advertisements set solid, regular want ad style; all capitals, 9c. a word; all capitals leaded, 12c. a word; minimum charge \$1 an insertion; payable in advance (see next paragraph).

**Ten per cent discount** if one payment is made in advance for four or more consecutive insertions. Advertisements other than "Positions Wanted" will be billed monthly if run more than four times.

**Add five words** for address if replies are to come to a box number address at any of our offices. These replies are forwarded each day as received, in new envelopes, at no extra charge.

**Refund will be made** if all insertions ordered are not needed, the amount refunded being the difference between cost of insertions given and full amount paid.

**Telephone orders** must be confirmed in writing same day. No allowances can be made for errors of any kind unless prompt notification is sent us.

**When replying** to blind ads be careful to put on your envelope the correct box number and do not enclose original letters of recommendation—send copies.

**Displayed advertisements** are sold by the inch. Rates will be furnished upon application.

**The right is reserved** to refuse any advertisement and also to rewrite and edit copy furnished whenever the publishers consider it advisable to do this.

## THE BROADCASTER DEPARTMENT THE CLASS JOURNAL COMPANY

239 W. 39th St., New York  
5 S. Wabash Ave., Chicago

## PARTS and REPAIRS

## AUTO Save 50 — 90% 2000 Models PARTS

NEW AND USED GEARS, AXLES, BEARINGS, SPRINGS, MAGNETOS, GENERATORS, ETC. JOBBERS IN BANKRUPT AUTO SUPPLIES.

### BRIGHTMAN AUTO EXCHANGE

821 Windsor Ave. HARTFORD, CONN.

## PATENTS and PATENT ATTORNEYS

## PATENTS

BOOKLET FREE HIGHEST REFERENCES  
PROMPTNESS ASSURED BEST RESULTS

Send drawing or model for examination and report as to patentability  
WATSON E. COLEMAN, Patent Lawyer  
644 G. Street, N. W., Washington, D. C.

Attorney-at-Law and Solicitor of Patents  
C. L. PARKER  
Formerly Member Examining Corps, United States Patent Office  
American and foreign Patents secured. Searches made to determine patentability and validity. Patent suits conducted. Pamphlet of instruction sent upon request.  
McGill Building, WASHINGTON, D. C.

## MISCELLANEOUS

**WILL SELL** at a sacrifice a fully equipped small garage with gasoline and accessory station combined. On main road between Kalamazoo and Battle Creek, Mich., on Detroit-Chicago Highway. Average daily sales around \$75. Inventory, \$7,000. Can be bought for much less as it is necessary for owner to make a change of climate. Address Box 6171, c/o Motor Age, 5 So. Wabash Ave., Chicago, Ill.

**FOR SALE**—Prosperous Garage in brick building on Dixie Highway in Illinois, with Chevrolet Agency. 125 cars sold in last four months. Well equipped shop and fine sales room. Handle a full line of tires, oil and accessories. Room for 60 cars in storage. Good reasons for selling. Address Box 6172, care Motor Age, 5 S. Wabash Ave., Chicago, Illinois.

## "WILL TRADE OR SELL"

Prosperous automobile accessories and tire business located in one of the most progressive cities in Northern California. I want to go East. You may want to come West. Let's trade. Business is worth about \$40,000 and it's growing fast. What have you to trade? Address Box 6169, c/o Motor Age, 5 S. Wabash Ave., Chicago, Ill.

**FOR SALE**—Garage and Ford agency in Southwest, one hundred car contract, stock and equipment will invoice about \$15,000. Only three used cars, several of largest oil companies leasing and drilling in neighborhood, only cash deal considered. Box 6174 care Motor Age, 5 S. Wabash, Chicago, Ill.

**FOR SALE** or royalty U. S. Patent applied. Ford rear fender, body and running board brace, very simple, attractive, two minutes to install. Frank Roemer, Union, Okla.

**MOTOR AND TRANSMISSION** for service Model HX Truck. Good condition. Selling account State License too high. Address Box 6164, care of Motor Age, 5 S. Wabash Ave., Chicago, Ill.

**FOR SALE**—Liberty aircraft engines 400 h. p. REQUIRED—Spare parts same engines. Agents wanted. Auguste Michel, Arsenal, Strasbourg, France.

## HELP WANTED

**ATTRACTIVE OPPORTUNITY FOR SALESMAN**—Experienced Pressed Steel and Stamping salesman, one with contact with automobile and other stamping users. Plant located in Middle West, offers attractive proposition to the right man. All correspondence held confidential. Address Box 6163, care of Motor Age, 5 S. Wabash Ave., Chicago, Ill.

**SALESMEN WANTED TO ACT AS DISTRIBUTORS** ON INCANDESCENT AUTOMOBILE BULBS. TO CARRY STOCK AND MAKE DELIVERIES FROM THEIR CARS. GOOD OPPORTUNITY. ADDRESS BOX 6155 CARE OF MOTOR AGE, 5 S. WABASH AVE., CHICAGO, ILL.

## SITUATIONS WANTED

Vice-President and General Manager of one of the largest successful corporations manufacturing automobile parts and accessories is ready to confer with parties interested in securing a real executive who knows thoroughly the manufacture and distribution of automobiles, motors, accessories, electric appliances and kindred lines. One who is capable of assuming full control of any concern regardless of size. Correspondence will be held strictly confidential. Address Box 6167, c/o Motor Age, 5 S. Wabash avenue, Chicago, Illinois.





**\$125**  
RETAIL

No place like the pump to sell a gas gauge!  
No other gauge so easy as the Tasco to demonstrate!  
After filling the tank, instead of screwing in the regular Ford or Chevrolet cap, slip in a Tasco—then show it to the owner. When he sees at a glance the amount of gas in his tank, realizes what a convenience such a gauge will be to him—he'll say—"how much"? When you come back at him with "one twenty-five"—he usually drives away with a Tasco in his tank!  
Tascos measure accurately, all working parts are enclosed—will outlast the car. Write for discounts.

**AKRON-SELLE CO.,**  
AKRON, OHIO  
"40 Years in Business"

**TASCO GAS GAUGES**  
Ford and Chevrolet



**Rimplex**

Second Spare Tire Carrier for all cars.  
"The tire carrier with the Bull Dog Grip"

Sell 'em for  
**Balloon Tires, Too**

Security and neatness of RIMPLEX appeals to car owners who wish to carry one or MORE extra spares. Small investment with active turn-over for dealers. Write for story.

Type "A"—RIMPLEX—fits all 30x3 and 3½ clincher rims...\$3.00  
Type "B"—RIMPLEX—fits all 3½ and 4 S. S. and 4.40 balloon type rims... 3.50  
Type "C"—RIMPLEX—fits all 4½ and 5.25 and 6.20 balloon type rims... 4.00

**TRIPP-SECORD & CO.**  
606 Kerr Bldg., Detroit, Mich.



Set of Three Hold with a Bull Dog Grip.

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*The good Painter  
uses*

a  
good  
brush.

Because  
he is wise,  
as well as good,  
he selects

**WHITING-ADAMS  
BRUSHES**

Good painters know through  
experience that the "goodness"  
of the job is determined by the  
goodness of the brush.

START WITH A  
WHITING-ADAMS  
BRUSH  
AND BE SURE OF A  
GOOD FINISH

**JOHN L. WHITING - J. J. ADAMS CO., BOSTON, U. S. A.**  
Brush Manufacturers for Over 116 Years and the Largest in the World

**"NORMA"**

**BALL BEARINGS**

**PRECISION  
BEARINGS**

**HOFFMANN**  
ROLLER BEARINGS

THE NORMA COMPANY OF AMERICA  
ANABLE AVE., LONG ISLAND CITY, N.Y.





# Stop the Leak!



It is possible to make money selling motor cars. No business offers a better opportunity. But you cannot do it if you are compelled to spend more to get business than the profit which accrues from the sale of the merchandise.

Extravagant advertising; exorbitant overhead; costly carrying charges on excessive stocks of cars; unseasonable and unnecessary changes in product impose burdens that no normal business can withstand.

The policies of the Stutz Company are intended to give the automobile dealer the same freedom in the conduct of his business that merchants in other lines enjoy.

It does not impose obligations that are a constant drain on the dealer's resources.

The Stutz franchise enables a dealer to make a reasonable profit on a reasonable volume of business. It is conceived on the premise that good merchants will sell just as many cars as they can and that worthwhile merchants know how to run their business profitably both for themselves and the factory.

A Stutz franchise stops the leaks in the automobile business by enabling the dealer to keep as profit that which ordinarily is frittered away in unnecessary expense. Investigate and find out.

## STUTZ SIXES

STUTZ MOTOR CAR COMPANY of AMERICA, Inc., Indianapolis, Indiana  
Builders of the Original and Genuine Stutz Motor Cars



# BLACK & DECKER ELECTRIC BENCH GRINDER

Price **\$38**  
IN CANADA \$50



(Complete with two Grinding Wheels, 6 inches in diameter by 1/2-inch face.)

A SIX INCH ELECTRIC BENCH GRINDER DESIGNED PARTICULARLY FOR AUTOMOTIVE SERVICE REQUIREMENTS.

Unusually powerful, but light in weight. Need not be fastened to bench as the rubber feet hold it from moving under grinding pressure. This feature together with carrying handle makes it easy to move from one place to another as required.

Practically vibrationless (a lead pencil can be balanced on the grinder while it is running). The smooth operation insures long life.

A husky, reliable machine tool which lives up to BLACK & DECKER STANDARDS in every way, at a price very little more than you would pay for an ordinary grinder. You can secure it from your own jobber without delay.

Write for new Black & Decker Miniature Catalogue of Electric Tools.

**THE BLACK & DECKER MFG. CO.**  
TOWSON, MD.

Branch Offices with Service Stations located in the following cities

BOSTON  
NEW YORK  
PHILADELPHIA

DETROIT  
CLEVELAND  
ATLANTA

CHICAGO  
KANSAS CITY  
SAN FRANCISCO

Canadian Factory, Lyman Tube Building, Montreal, P. Q.



"The Best-Equipped Shop Gets the Business"



**New V&V Windshield**  
(vision & ventilation)



CLOSED



OPEN

Slides silently upward instead of tilting. Operated by a convenient regulator handle. Make a point of seeing and studying this remarkable improvement.

## Two Superb New Sedans

*With another big, new selling feature*

**I**N the two new sedans they are displaying, Chandler dealers not only have the most richly beautiful bodies that were ever offered on the famous Chandler chassis—

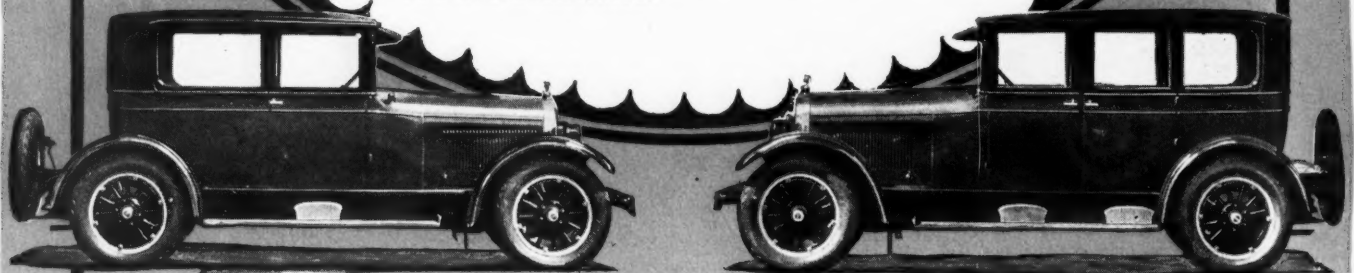
—but into those new bodies Fisher has built a radical new feature that will prove a mighty aid in closing sales.

That is the new V & V Windshield, a single plate of glass which provides full or cowl ventilation by sliding upward in felt lined channels instead of tilting.

With no quadrants or braces, no thumb screws to rattle, no rubber strip to impair vision or leak water, operating easily by a turn handle, the V & V Windshield represents a radical and valued improvement over existing types of windshields.

This is closed car selling season. Here are cars that are destined to win a prompt and enthusiastic reception. We leave the rest to your good judgment.

**B**OTH new models are powered by the Pikes Peak Motor and incorporate the Traffic Transmission (Campbell patent) with its certain, clash-proof action. Prices quoted include full balloon tire equipment, nickelled radiator shell, motometer, bumper, automatic windshield wiper regulated from dash, and leather covered visor. Standard colors are black and Luxor blue. Other low priced models are, Touring Car \$1585 and Four-door Sedan \$1995.



Chummy Sedan \$2045

f. o. b. Cleveland

Metropolitan De Luxe \$2195

THE CHANDLER MOTOR CAR COMPANY • CLEVELAND  
Export Department: 1819 Broadway, New York City Cable Address "Chanmotor"

# 1925 CHANDLER